Vol. 1108 Number 2

OFFICIAL GAZETTE

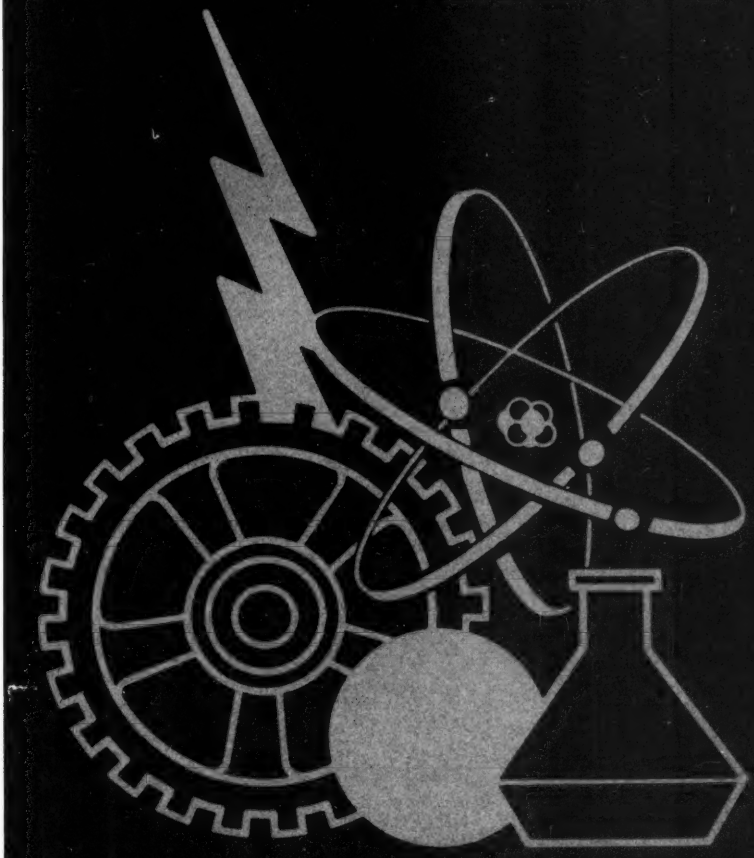
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

NOVEMBER 14, 1989



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

November 14, 1989 Volume 1108 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1107 O.G. 5 on Oct. 3, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Sept. 1, 1989, and was announced in the *Official Gazette* at 1105 O.G. 36 on Aug. 15, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1040.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

Sept. 12, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on November 11, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,621,377 through 4,622,695
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 9, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,357,714 through 4,358,858
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

" (e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 27, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,536,895	06/466,918	08/27/85
4,536,896	06/495,415	08/27/85
4,536,900	06/612,619	08/27/85
4,536,903	06/510,340	08/27/85
4,536,915	06/476,282	08/27/85
4,536,921	06/436,912	08/27/85
4,536,924	06/586,267	08/27/85
4,536,926	06/568,043	08/27/85
4,536,935	06/449,143	08/27/85
4,536,957	06/495,997	08/27/85
4,536,958	06/443,743	08/27/85
4,536,960	06/631,828	08/27/85
4,536,961	06/594,101	08/27/85
4,536,967	06/569,399	08/27/85
4,536,968	06/620,693	08/27/85
4,536,969	06/537,718	08/27/85
4,536,976	06/516,108	08/27/85
4,536,977	06/591,971	08/27/85
4,536,978	06/573,681	08/27/85
4,536,980	06/527,741	08/27/85
4,536,983	06/522,442	08/27/85
4,536,994	06/530,062	08/27/85
4,536,997	06/441,173	08/27/85
4,536,999	06/497,848	08/27/85
4,537,028	06/520,924	08/27/85
4,537,030	06/446,649	08/27/85
4,537,031	06/405,422	08/27/85
4,537,035	06/607,185	08/27/85
4,537,039	06/501,164	08/27/85
4,537,048	06/515,690	08/27/85
4,537,049	06/477,319	08/27/85
4,537,058	06/395,171	08/27/85
4,537,063	06/611,101	08/27/85
4,537,079	06/589,147	08/27/85
4,537,084	06/416,714	08/27/85
4,537,089	06/457,844	08/27/85
4,537,091	06/479,193	08/27/85
4,537,094	06/466,038	08/27/85
4,537,108	06/480,128	08/27/85
4,537,115	06/618,284	08/27/85
4,537,121	06/605,101	08/27/85
4,537,146	06/434,922	08/27/85
4,537,149	06/418,057	08/27/85
4,537,151	06/635,934	08/27/85
4,537,155	06/663,414	08/27/85
4,537,167	06/557,947	08/27/85
4,537,169	06/499,401	08/27/85
4,537,170	06/585,218	08/27/85
4,537,173	06/655,188	08/27/85
4,537,175	06/676,514	08/27/85
4,537,184	06/536,342	08/27/85
4,537,186	06/528,865	08/27/85
4,537,190	06/447,584	08/27/85
4,537,198	06/491,238	08/27/85
4,537,201	06/530,522	08/27/85
4,537,206	06/424,487	08/27/85
4,537,210	06/448,902	08/27/85
4,537,211	06/495,247	08/27/85
4,537,232	06/596,544	08/27/85
4,537,235	06/581,555	08/27/85
4,537,237	06/561,123	08/27/85
4,537,240	06/502,722	08/27/85
4,537,242	06/616,023	08/27/85
4,537,246	06/559,782	08/27/85
4,537,256	06/503,595	08/27/85
4,537,261	06/585,240	08/27/85
4,537,268	06/544,895	08/27/85
4,537,279	06/515,981	08/27/85
4,537,282	06/593,841	08/27/85
4,537,283	06/628,665	08/27/85
4,537,293	06/594,431	08/27/85
4,537,295	06/438,482	08/27/85
4,537,297	06/457,143	08/27/85
4,537,302	06/441,799	08/27/85
4,537,309	06/532,861	08/27/85
4,537,310	06/613,959	08/27/85
4,537,315	06/606,475	08/27/85
4,537,318	06/607,640	08/27/85
4,537,324	06/668,793	08/27/85
4,537,333	06/285,346	08/27/85
4,537,340	06/527,243	08/27/85
4,537,345	06/463,328	08/27/85
4,537,350	06/508,178	08/27/85
4,537,353	06/470,794	08/27/85
4,537,362	06/378,216	08/27/85
4,537,364	06/449,920	08/27/85
4,537,368	06/605,789	08/27/85

Patent Number	Serial Number	Issue Date
4,537,378	06/639,188	08/27/85
4,537,379	06/362,024	08/27/85
4,537,389	06/565,292	08/27/85
4,537,393	06/502,189	08/27/85
4,537,398	06/457,742	08/27/85
4,537,399	06/627,512	08/27/85
4,537,403	06/553,584	08/27/85
4,537,407	06/584,372	08/27/85
4,537,414	06/477,283	08/27/85
4,537,421	06/567,742	08/27/85
4,537,432	06/423,754	08/27/85
4,537,433	06/584,111	08/27/85
4,537,435	06/593,942	08/27/85
4,537,437	06/547,106	08/27/85
4,537,440	06/489,819	08/27/85
4,537,447	06/382,650	08/27/85
4,537,448	06/550,939	08/27/85
4,537,450	06/494,622	08/27/85
4,537,451	06/469,998	08/27/85
4,537,452	06/425,664	08/27/85
4,537,455	06/478,531	08/27/85
4,537,463	06/625,206	08/27/85
4,537,467	06/505,278	08/27/85
4,537,474	06/355,757	08/27/85
4,537,480	06/500,069	08/27/85
4,537,483	06/612,646	08/27/85
4,537,486	06/595,826	08/27/85
4,537,503	06/417,191	08/27/85
4,537,522	06/509,687	08/27/85
4,537,526	06/672,236	08/27/85
4,537,527	06/383,167	08/27/85
4,537,534	06/507,765	08/27/85
4,537,542	06/602,224	08/27/85
4,537,543	06/512,354	08/27/85
4,537,546	06/516,703	08/27/85
4,537,549	06/610,196	08/27/85
4,537,554	06/457,990	08/27/85
4,537,555	06/693,223	08/27/85
4,537,556	06/493,921	08/27/85
4,537,561	06/469,421	08/27/85
4,537,564	06/587,801	08/27/85
4,537,565	06/463,407	08/27/85
4,537,571	06/524,090	08/27/85
4,537,579	06/530,042	08/27/85
4,537,580	06/529,741	08/27/85
4,537,586	06/581,547	08/27/85
4,537,588	06/570,872	08/27/85
4,537,597	06/611,536	08/27/85
4,537,605	06/574,948	08/27/85
4,537,616	06/509,456	08/27/85
4,537,626	06/551,919	08/27/85
4,537,668	06/272,206	08/27/85
4,537,671	06/511,266	08/27/85
4,537,685	06/463,006	08/27/85
4,537,698	06/499,685	08/27/85
4,537,704	06/563,801	08/27/85
4,537,714	06/511,672	08/27/85
4,537,723	06/545,107	08/27/85
4,537,728	06/431,452	08/27/85
4,537,739	06/524,935	08/27/85
4,537,749	06/507,924	08/27/85
4,537,761	06/611,343	08/27/85
4,537,780	06/662,116	08/27/85
4,537,790	06/493,715	08/27/85
4,537,798	06/518,913	08/27/85
4,537,817	06/558,489	08/27/85
4,537,825	06/542,711	08/27/85
4,537,838	06/598,278	08/27/85
4,537,842	06/504,472	08/27/85
4,537,845	06/543,385	08/27/85
4,537,846	06/543,285	08/27/85
4,537,850	06/527,699	08/27/85
4,537,868	06/594,415	08/27/85
4,537,878	06/597,378	08/27/85
4,537,886	06/479,953	08/27/85
4,537,888	06/527,442	08/27/85
4,537,895	06/500,969	08/27/85
4,537,905	06/461,304	08/27/85
4,537,924	06/532,127	08/27/85
4,537,941	06/644,949	08/27/85
4,537,955	06/470,943	08/27/85
4,537,962	06/459,188	08/27/85
4,537,971	06/536,133	08/27/85
4,537,989	06/485,587	08/27/85
4,538,011	06/603,301	08/27/85
4,538,022	06/451,737	08/27/85
4,538,034	06/476,761	08/27/85
4,538,035	06/541,687	08/27/85
4,538,036	06/648,232	08/27/85
4,538,047	06/555,364	08/27/85
4,538,056	06/698,742	08/27/85
4,538,064	06/441,167	08/27/85
4,538,074	06/525,864	08/27/85
4,538,078	06/481,696	08/27/85
4,538,082	06/389,585	08/27/85
4,538,092	06/507,741	08/27/85
4,538,103	06/412,866	08/27/85
4,538,118	06/414,372	08/27/85
4,538,129	06/394,475	08/27/85
4,538,132	06/423,240	08/27/85
4,538,148	06/306,342	08/27/85
4,538,168	06/596,079	08/27/85
4,538,171	06/310,255	08/27/85
4,538,173	06/455,471	08/27/85
4,538,177	06/553,970	08/27/85
4,538,200	06/476,115	08/27/85
4,538,202	06/582,812	08/27/85
4,538,204	06/348,762	08/27/85
4,538,206	06/615,562	08/27/85
4,538,207	06/594,877	08/27/85
4,538,208	06/612,554	08/27/85
4,538,210	06/479,996	08/27/85
4,538,215	06/552,698	08/27/85
4,538,221	06/483,001	08/27/85
4,538,222	06/483,031	08/27/85
4,538,230	06/437,891	08/27/85
4,538,256	06/442,123	08/27/85
4,538,262	06/520,122	08/27/85
4,538,263	06/502,084	08/27/85
4,538,268	06/476,021	08/27/85
4,538,270	06/481,606	08/27/85
4,538,278	06/414,503	08/27/85
4,538,285	06/472,375	08/27/85
4,538,296	06/516,040	08/27/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,482,063, Re. S. N. 416,605, Filed Oct. 2, 1989, Cl. 211/69.1, COMPUTER TERMINAL SUPPORT AND HAND REST, Joseph J. Berke, et al., Owner of Record: *Inventor*, Attorney or Agent: Theodore W. Olds, Ex. Gp.: 355

4,676,074, Re. S. N. 374,466, Filed June 30, 1989, Cl. 62/277, REFRIGERATION SYSTEM FOR A COUNTER-TOP OR WALL-MOUNTED VENDING MACHINE, Annis R. Morgan Jr., Owner of Record: *Coca Cola Co., Atlanta, Ga.*, Attorney or Agent: Anthony L. Birch, Ex. Gp.: 344

4,685,221, Re. S. N. 391,800, Filed Aug. 9, 1989, Cl. 34/155, STEAM-SHOWER APPARATUS AND METHOD OF USING SAME, Bruce F. Taylor, Owner of Record: *Thermo Flectron, Auburn, Ind.*, Attorney or Agent: Anthony M. Lourusso, Ex. Gp.: 344

4,697,937, Re. S. N. 417,795, Filed Oct. 5, 1989, Cl. 384/486, BEARING ARRANGMENT WITH A SEAL, Ove Karlsson, et al., Owner of Record: *SKF Mekanprodukter Ab, Katrineholm, Sweden*, Attorney or Agent: Eugene E. Renz, Jr., Ex. Gp.: 245

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,159,933, Reexam. No. 90/001,863, Requested Oct. 14, 1989, Cl. 204/280R, SAMPLE CONCENTRATOR, William B. Allington, et al., Owner of Record: *Instrumentation Specialties Co., Lincoln, Ne.*, Attorney or Agent: Vincent L. Carney, Ex. Gp.: 110, Requester: E-C Apparatus Corp., St. Petersburg, Fla.

4,164,464, Reexam. No. 90/001,864, Requested Oct. 13, 1989, Cl. 204/299, SAMPLE CONCENTRATOR, William B. Allington, Owner of Record: *Instrumentation Specialties Co., Lincoln, Ne.*, Attorney or Agent: Vincent L. Carney, Ex. Gp.: 110, Requester: E-C Apparatus Corp., St. Petersburg, Fla.

4,330,280, Reexam. No. 90/001,860, Requested Oct. 10, 1989, Cl. 433/90, EJECTOR HOLDER FOR CAPSULE-LIKE CARTRIDGE, Emery Dougherty, Owner of Record: *Dentsply Research & Dev. Corp., Milford De.*, Attorney or Agent: C. Hercus Just, Ex. Gp.: 330, Requester: Centrix Inc., Milford, Conn.

4,511,207, Reexam. No. 90/001,861, Requested Oct. 10, 1989, Cl. 350/96.150, FIBER OPTIC DATA DISTRIBUTOR, Steven A. Newton, et al., Owner of Record: *The Board of Trustees of Leeland Stanford Jr. University, Stanford, Calif.*, Attorney or Agent: Knobbe, Martens, Olson & Bear, Ex. Gp: 250, Requester: Owner

4,760,248, Reexam. No. 90/001,859, Requested Oct. 6, 1989, Cl. 235/472, PORTABLE LASER DIODE SCANNING HEAD, Jerome Swartz, et al., Owner of Record: *Symbol Technologies, Inc., Bohemia, N. Y.*, Attorney or Agent: Daniel McGlynn, Ex. Gp.: 230, Requester: Owner

4,790,553, Reexam. No. 90/001,862, Requested: Oct. 11, 1989, Cl. 280/242OWC, LIGHTWEIGHT WHEELCHAIR HAVING SWING-AWAY FOOTREST ASSEMBLY, James Okamoto, Owner of Record: *Motion Designs Inc., Fresno, Calif.*, Attorney or Agent: Flehr, Hohbach, Test, et al., Ex. Gp.: 310, Requester: Ernest & Jenning Inc., Caarillo, Calif.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

University Communications, Inc., Rahway, N. J., Reg. No. 882,907, for the mark "BUSINESS WORLD", Canc. No. 17,901.

Developmental Sciences, Inc., City of Industry, Calif., Reg. No. 1,047,202, for the mark "PHANTOM", Canc. No. 18,090.

ERMA S. BROWN
Administrator of the Trademark Trial and Appeal Bord
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

Filing of Certain Papers with the Board of Patent Appeals and Interferences by Facsimile Transmission

A facsimile machine has recently been installed at the Board of Patent Appeals and Interferences (Board). Accordingly, a party who wishes to file papers in a patent application or reexamination proceeding in which an appeal is pending and which is located at the Board may do so via the Board's facsimile machine, the tetephone number of which is (703)557-8642. Normally, the file of a patent application or reexamination proceeding in which an appeal is pending is forwarded to the Board approximately six weeks after the examiner's answer has been mailed.

Certain papers in interference proceedings may also be filed via the Board's facsimile machine, for example, motions, briefs, designations of lead attorney, etc. The following are *excluded:* transcripts of depositions or of interrogatories, cross-interrogatories or recorded answers; preliminary statements; exhibits; and evidentiary records under 37 CFR 1.653.

All papers filed with the Board by facsimile transmission are subject to the provisions, requirements and exclusions stated in the Commissioner's Notice of October 19, 1988 (1096 O.G. 30, Nov. 15, 1988), entitled "Filing of Certain Papers and Authorization to Charge Deposit Accounts by Facsimile Transmission."

October 17, 1989

SAUL I. SEROTA
Chairman
Board of Patent Appeals and Interferences

Application for Recordation of Trade Name: "TRIPLE FAT GOOSE"

Action: Notice of Application for Recordation of Trade Name
Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U. S. C. 1124), of the trade name "TRIPLE FAT GOOSE", used by Turbo Sportsware, Inc., a corporation organized under the laws of the State of New Jersey, located at One Walnut Street, Perth Amboy, New Jersey 08862.

The application states that the trade name is used in connection with men's and boy's down filled outwear and active sportswear. The merchandise is manufactured in Korea.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before October 30, 1989.

Address: Written comments should be addressed to U. S. Customs Service, Attention: Value, Special Programs and Admissibility Branch, 1301 Constitution Ave., N. W. (Room 2104), Washington, D. C. 20229.

For Further Information Contact: Velma Taylor, Value, Special Programs and Admissibility Branch, 1301 Constitution Ave., N. W. Washington, D. C. 20229 (202-566-5765).

Aug. 23, 1989

MARVIN M. AMERNICK
Chief,
Value, Special Programs and Admissibility Branch

Patents Availible for License or Sale

Inquiries about the Patents listed below should be directed to Constant V. David, 4952 Field St., San Diego, Calif. 92110

4,379,701	BOUYANT APPARATUS PROPELLEDBY A HUMAN OPERATOR
4,399,654	POWER PLANT HAVING A FREE-PISTON COMBUSTION MEMBER
4,432,735	HUMAN PROPELLED BOUYANT AN NUALAR FLOAT WITH REMOVABLE PONTOON STABILIZER
4,535,724	TRAINING AND CARE APPARATUS FOR HORSES
4,543,67	WATER SAVING INSERT FOR TOILET TANKS
4,558,971	CONTINUOUS PIPELINE FABRICA-TION METHOD
4,560,473	MACERATOR- DECANTER
4,561,131	DUAL FLUSH TOILET FOR WATER SAVING
4,561,656	BAR RIDING WHEEL
4,617,697	MOLDABLE HANDLE ADAPTER
4,629,629	METHOD FOR PROCESSINGAVOCODOS
4,650,400	HELICOPTER BLADE-PITCH ADJUST-ING SYSTEM
4,653,274	METHOD OF CONTROLLING A FREE-PISTON EXTERNAL-COMBUSTION ENGINE
4,665,703	EXTERNAL COMBUSTION ENGINE WITH AIR-SUPPORTED FREE PISTON
4,699,727	DOUBLE-BAR RIDING WHEEL AND METHOD OF USING SAME
4,683,541	ROTARY FLUIDIZED-BED COMBUS-TION SYSTEM
4,697,986	HELICOPTER BLADE CYCLIC PITCH CONTROL SYSTEM
4,730,795	HELIPANE
4,739,668	INFINITELY VARIABLE (IV) POSITIVE DRIVE SYSTEM
4,749,121	THREE-BAR AND BALL GAME AP PARATUS AND METHOD OF USING SAME
4,747,269i	VARIABLE SPEED POWER-TRANSMIT-TING SYSTEM
4,760,701	EXTERNAL COMBUSTION ROTARY ENGINE
4,815,294	GAS TURBINE WITH EXTERNAL FREE-PISTON COMBUSTOR
4,818,834	FLEXIBLE CONFORMABLE VANES MADE OF CARBONANCEOUS MATERIALS
4,833,469	OBSTACLE PROXIMITY DECTECTOR FOR MOVING VEHICLE AND METHOD FOR USE THEREOF

PATENT PENDING:

Serial No.	
07/037,512	METHOD FOR FABRICATING AND INSERTING REINFORCING SPIKES IN A 3-D REINFORCED STRUCTURE
07/335,949	SERVO-POWER SYSTEM FOR HELI PANE BLADE ACTUATION AND METHOD THEREOF
07/335,994	SHOCK-ABSORBING SYSTEM FOR PULSED NUCLEAR POWER PLANT

4,266,112 WEB-CUTTING PROCESS, William P. Niedermeyer, 1024 Mount Mary Dr., Green Bay, Wisc. 54301

4,482,939 DIRECTIONALLY VARIABLE LIGHTING ASSEMBLY, Andrew Tishman, Enterprises Inc., 170 East 88th St. #8B New York, N. Y. 10128

4,576,178 AUDIO SIGNAL GENERATOR, David Johnson, Box 68, 436 East 69th St., New York, N. Y. 10021

4,702,704 TETRAHEDRAL CONDON STERO-TABLE, Leonard R. Svensson, Birch, Stewart, Kolach & Birch, 301 N. Washington St., P.O. Box 747, Falls Church, Va. 22046

4,828,690 HAND TOOL FOR SIFTING DEBRIS FROM SAND SOIL, Obed Montez, 1050 C St., Salinas, Calif. 93905

4,834,727 EYE DROPPER BOTTLE ATTACHMENT FOR POST-SURGICAL AND GENERAL USE, Dr. Samuel M. Cope, 265 Western Promenade, Portland, Ma. 04102

4,845,788 WATER FILLABLE MATTRESS WITH COVER, Jeanette L. Myer, 7251 Hickory Ave., Orangevale, Calif. 95662

Errata

The following registration numbers were inadvertently listed as canceled in the "Trademark Registration Cancelled, Section 8" section of the Trademark Official Gazette of August 15, 1989:

TM 218 1,237,056 Aug. 15, 1989

TM 218 1,237,058 Aug. 15, 1989

TM 218 1,237,059 Aug. 15, 1989

Consequently, the above-identified registrations are still active.

Oct. 17, 1989 PATRICIA M. DAVIS
Administrator for
Trademark Operations

In the "Trademark Registration Renewed" section of the Trademark Official Gazette of April 11, 1989, the Prior U. S. Class for Registration No. 505,821 was incorrectly classified in Class 34.

The classification as corrected is Prior U. S. Class 14.

Oct. 17 1989 PATRICIA M. DAVIS
Administrator for
Trademark Operations

Registration Number 1,237,057, listed in the "Trademark Registrations Canceled, Section 8" section of the Trademark Official Gazette of August 15, 1989 was inadvertenly canceled as to International Classes 11 and 12.

TM 218 1,237,056 Aug. 15, 1989

Consequently, the above-identified registration is still active for International Classes 11 and 12.

Oct. 17, 1989 PATRICIA M. DAVIS
Administrator for
Trademark Operations

PATENT NOTICES

Certificates of Correction For Week of November 14, 1989

PP. 5,984	4,777,118	4,807,525	4,816,259
PP. 6,712	4,777,730	4,807,692	4,816,965
PP. 6,721	4,778,233	4,808,454	4,817,275
RE. 32,714	4,778,978	4,808,504	4,817,424
D. 299,084	4,780,132	4,808,558	4,817,731
D. 300,255	4,780,346	4,808,727	4,817,846
D. 300,627	4,781,685	4,808,780	4,818,172
4,330,559	4,787,595	4,809,361	4,818,197
4,461,199	4,787,922	4,809,568	4,818,222
4,471,102	4,788,569	4,809,573	4,818,300
4,580,033	4,793,764	4,809,685	4,818,547
4,643,543	4,794,736	4,810,316	4,818,565
4,661,725	4,794,817	4,810,402	4,818,790
4,675,797	4,795,684	4,810,568	4,818,881
4,683,145	4,795,697	4,810,850	4,819,681
4,684,733	4,796,126	4,810,936	4,819,710
4,689,764	4,796,948	4,810,942	4,819,760
4,695,472	4,797,000	4,811,373	4,819,834
4,703,008	4,798,195	4,811,508	4,820,169
4,708,803	4,798,561	4,811,583	4,820,253
4,713,829	4,798,650	4,811,613	4,820,563
4,726,827	4,798,777	4,811,651	4,820,592
4,732,989	4,798,780	4,811,699	4,820,664
4,735,034	4,799,414	4,812,084	4,820,758
4,735,631	4,800,626	4,812,258	4,821,009
4,737,939	4,800,875	4,812,929	4,821,022
4,743,931	4,800,953	4,813,202	4,821,382
4,743,944	4,801,074	4,813,292	4,821,582
4,744,272	4,801,250	4,813,401	4,821,720
4,744,294	4,801,596	4,813,434	4,821,829
4,745,494	4,803,488	4,813,612	4,821,931
4,751,275	4,803,538	4,813,803	4,821,951
4,753,728	4,803,546	4,814,035	4,822,001
4,754,301	4,803,824	4,814,092	4,822,157
4,758,565	4,804,201	4,814,294	4,822,416
4,761,323	4,804,371	4,814,532	4,823,146
4,762,849	4,804,526	4,815,194	4,824,247
4,764,838	4,805,314	4,815,337	4,824,703
4,767,169	4,805,560	4,815,349	4,825,098
4,768,565	4,805,602	4,815,512	4,828,845
4,769,080	4,805,772	4,815,562	4,829,930
4,771,972	4,805,952	4,815,630	4,830,299
4,773,897	4,806,450	4,815,921	4,831,350
4,774,079	4,807,072	4,816,026	4,832,836
4,774,180	4,807,122	4,816,064	4,834,233
4,774,309	4,807,227	4,816,196	

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Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 275-2562
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institite of Technology	(404) 894-4508
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF October 7, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	9-10-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	9-24-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	5-28-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 S. LEVY, Acting Director	8-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	5-18-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during October 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,694,814 to 3,702,011 inclusive
Plant Patents ..... None

REEXAMINATIONS

NOVEMBER 14, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,891,585 (1156th)
ELASTOMERIC PAVEMENT REPAIR COMPOSITION FOR PAVEMENT FAILURE AND A METHOD OF MAKING THE SAME
Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009
Reexamination Request No. 90/001,591, Aug. 30, 1988.
Reexamination Certificate for Patent No. 3,891,585, issued Jun. 24, 1975, Ser. No. 376,919, Jul. 5, 1973.
Continuation-in-part of Ser. No. 589,190, Oct. 21, 1966.
Int. Cl.[4] C08C *11/68, 17/22;* **C08D** *9/00;* **C08L** *95/00;* **C08J** *3/02*
U.S. Cl. 523—307

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **11–20** is confirmed.

Claims **1** and **9** are determined to be patentable as amended.

Claims **2–8** and **10**, dependent on an amended claim, are determined to be patentable.

1. An elastomeric pavement repair material which consists essentially of paving grade asphalt with a penetration range of 10 through 300 and particulate non-oil resistant asphalt soluble rubber which have been mixed *at an elevated temperature* in a ratio of about two to about three parts asphalt to about one part rubber and which have been heated together at a temperature within the range of about 350° and about 500° F. to form a jellied composition.

9. An elastomeric pavement repair material which consists essentially of paving grade asphalt with a penetration range of 10 through 300 and rubber tire buffings of non-oil resistant asphalt soluble rubber which have been mixed *at an elevated temperature* in a ratio of about 2 to about 3 parts asphalt to about one part rubber and which have been *heated* together at a temperature within the range of about 350° and about 500° F. to form a jellied composition.

11. A method of preparing an elastomeric pavement repair material which includes the steps of:

heating paving grade asphalt with a penetration range of 10 through 300 to a temperature within the range of from about 350° to about 500° F.;

adding one part particulate, non-oil resistant asphalt soluble rubber to the heated asphalt in the ratio of about two to about three parts of asphalt to one part rubber; and

mixing the resulting asphalt and rubber mixture to form a jellied composition.

B1 4,027,367 (1150th)
SPRAY BONDING OF NICKEL ALUMINUM AND NICKEL TITANIUM ALLOYS
Henry S. Rondeau, Shaker Heights, Ohio, assignor to Virginia C. Rondeau, Executrix of State of Henry S. Rondeau
Reexamination Request No. 90/001,481, Apr. 4, 1988.
Reexamination Certificate for Patent No. 4,027,367, issued Jun. 7, 1977, Ser. No. 598,822, Jul. 24, 1975.
Int. Cl.[4] B05D *1/06;* **B32B** *15/04, 15/20*
U.S. Cl. 428—652

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–7, 10–16** are determined to be patentable as amended.

Claims **8, 9** and **17**, dependent on an amended claim, are determined to be patentable.

New claims **18–20** are added and determined to be patentable

1. A method of thermal spraying a substrate to deposit a self-bonding coating on such substrate, comprising supplying an electric arc thermal spray gun with a wire feed comprising an alloy of nickel and aluminum or titanium, and using such electric arc thermal spray gun, spraying said wire feed onto such substrate to coat the same thereby to establish a diffusion bond between such coating and such substrate to provide a self-bonding coating on such substrate *without exothermic reaction of composite materials during spraying.*

B1 4,199,219 (1151st)
DEVICE FOR SCANNING AN OBJECT WITH A LIGHT BEAM
Akiyoshi Suzki, Tokyo, and Yoichi Hirabayashi, Machida, both of Japan, assignors to Canon Kabushiki Kaisha
Reexamination Request No. 90/001,682, Dec. 28, 1988.
Reexamination Certificate for Patent No. 4,199,219, issued Apr. 22, 1980, Ser. No. 790,072, Apr. 22, 1977.
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

New claims **5–17** are added and determined to be patentable.

The patentability of claims **1–4** is confirmed.

1. A device for scanning an object having a flat reflection surface and an inclined surface with a certain inclination with respect to the flat reflection surface, comprising:

a. means for forming a relatively thin fixed light beam;

b. a defector for deflecting the light beam from the light forming means to scan across the object;

c. a lens system for receiving the deflected light beam from said deflector, including an objective lens facing the object, the optical axis of which objective lens is perpendicular to the flat reflection surface of said object and having a light source side focal plane, said objective lens being substantially so disposed that said deflected light beam continuously passes through the center of said light source side focal plane as it is being deflected;

d. a light detector for detecting light which has been reflected from said object and passed through said objective lens; and

e. optical filter means interposed between said objective lens and said light detector, for intercepting light from the flat reflection surface of said object and for directing the light from the inclined reflection surface to said light detector.

B1 4,203,130 (1152nd)

INFORMATION DISPLAYING SYSTEM

Joseph A. Doumit, New Iberia, La., and Robert E. Weiblen, Towson, Md., assignors to Dial-A-Channel, Inc., New Iberia, La.

Reexamination Request No. 90/001,595, Sep. 1, 1988.
Reexamination Certificate for Patent No. 4,203,130, issued May 13, 1980, Ser. No. 758,553, Jan. 11, 1977.
Int. Cl.[4] H04N *11/00, 5/265*
U.S. Cl. 358—1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–19** is confirmed.

Claim **3** is cancelled.

Claim **1** is determined to be patentable as amended.

Claims **2** and **4**, dependent on an amended claim, are determined to be patentable.

New claims **20–27** are added and determined to be patentable.

1. A system for continuously transmitting program schedule information over an informational television channel including: a plurality of data sources[,]; video mixing means connected to said sources *through a digital video signal generator* for combining information received therefrom *with a sync signal* to produce a composite video modulating output[,]; sequence control means connected to said sources for selection of the information fed to the mixing means[, and]; *through the digital video signal generator* clock means connected to the sequence control means for timing and updating the selected information fed *through the digital video signal generator* to the mixing means; *memory means for storing data representing a plurality of program listings fed thereto from a data source; and means for selecting readout of program listings data from the memory means to the digital video signal generator.*

B1 4,420,909 (1153rd)

WAFERING SYSTEM

Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Reexamination Request No. 90/001,684, Nov. 30, 1988.
Reexamination Certificate for Patent No. 4,420,909, issued Dec. 20, 1983, Ser. No. 320,097, Nov. 10, 1981.
Int. Cl.[4] B24B *7/20*
U.S. Cl. 51—73 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–19** is confirmed.

Claims **1–3**, **20**, **22** and **26** are cancelled.

Claims **21** and **23** are determined to be patentable as amended.

Claims **24** and **25**, dependent on an amended claim, are determined to be patentable.

New claims **27–39** are added and determined to be patentable.

4. A wafering system comprising

a rotary cutting blade having a bore and a cutting edge about said bore for severing a wafer from a delivered ingot;

a chuck assembly having a head for engaging a severed wafer from the ingot; and

means for moving said head between a rest position on one side of said blade and a wafer holding position on an opposite side of said blade, said means for moving said head including a carriage, a carriage guide extending tranversely of said blade, means for reciprocating said carriage along said guide, an arm secured to said head, an arm assembly having said arm secured therein and being pivotally mounted on said carriage, and means for pivoting said arm assembly to move said head through said bore in said blade.

B1 4,424,956 (1154th)

DRAPABLE CONSUMABLE HEAT RETENTION SHIELD FOR HOT METAL CARS

Louis A. Grant, Pittsburgh, and Arthur F. Trunzo, White Oak, both of Pa., assignors to Standard Steel Sponge

Reexamination Request No. 90/001,514, May 18, 1988.
Reexamination Certificate for Patent No. 4,424,956, issued Jan. 10, 1984, Ser. No. 368,277, Apr. 14, 1982.
Continuation-in-part of Ser. No. 342,517, Jan. 25, 1982.
Int. Cl.[4] F27D *3/00*
U.S. Cl. 266—248

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–8** are cancelled.

New claims **9–11** are added and determined to be patentable.

9. A lightweight manually positionable, drapable, consumable, heat retention shield for conserving the heat of the interior lining of a hot metal car into which hot metal is to be poured through an aperture in the hot metal car, said heat retention shield comprising:

a panel having a first metallic lattice, a second metallic lattice spaced from said first metallic lattice and a fibrous refractory sheet located between said first metallic lattice and said second metallic lattice, said metallic lattices comprising cross-strips along said fibrous refractory sheet and fastening means connecting said first and second metallic lattices to retain said fibrous refractory sheet therebetween, said panel being formed with a depressed cavity spaced from the periphery thereof, said depressed cavity having a bottom wall and side walls and end walls extending upwardly from the periphery of said bottom wall, and a flange extending outwardly away from said sidewalls and said end walls, a peripheral support frame of combustible material supporting said periphery of said fibrous refractory sheet, whereby said bottom wall, said side walls and said end walls are adapted to extend downwardly from said panel into the aperture in a hot metal car when the heat retention shield is in place on a hot metal car and said outwardly extending flange of said panel is adapted to rest on the exterior surface of a hot metal car when the heat shield is in place on the car and is draped thereover, said heat retention shield being held in place on the hot metal car by placing said bottom wall, said side walls and said end walls of said depressed cavity into the aperture in the hot metal car without any mechanical means attaching said heat retention shield to the hot metal car and whereby hot metal poured into the hot metal car through the aperture is poured into said depressed cavity to force the heat shield through the aperture into the hot metal car wherein it is consumed.

B1 4,514,636 (1155th)
ION TREATMENT APPARATUS
Monroe L. King, Austin, Tex., assignor to Eaton Corporation
Reexamination Request No. 90/001,575, Aug. 9, 1988.
Reexamination Certificate for Patent No. 4,514,636, issued Apr. 30, 1985, Ser. No. 640,538, Aug. 13, 1984.
Continuation of Ser. No. 523,908, Aug. 16, 1983, abandoned, and a continuation of Ser. No. 185,075, Sep. 8, 1980, abandoned, which is a division of Ser. No. 75,401, Sep. 14, 1979, Pat. No. 4,261,762.
Int. Cl.[4] G01N *23/00;* **H01L** *21/00*
U.S. Cl. 250—443.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2** and **5** are determined to be patentable as amended.

Claims **3**, **4** and **6**, dependent on an amended claim, are determined to be patentable.

1. An apparatus for treating substantially flat wafer articles with a focused ion beam comprising:

a high vacuum chamber [adapted to be] evacuated to a pressure a substantial number of orders of magnitude below 1 torr, sufficient to enable formation and focusing of said ion beam,

a treating station within said high vacuum chamber, means for producing, focusing and directing said ion beam onto wafer articles at the treating station,

a mounting member having a substantially [,] flat, temperature-controlled support surface on which each wafer is positioned at the treating station, and means for controlling the temperature of the wafer comprising

an open clamping member for engageing one flat surface of said wafer at its periphery to clamp the other flat surface of said wafer against said substantially flat support surface of said mounting member,

said focused beam passing through the opening of said clamping member to said one surface of said wafer,

means for introducing, to the interface between the surface of the wafer and the surface of the mounting member, gas under subatmospheric pressure of sufficient value to enable the gas to have substantial heat conductance, said pressure being greater than about 1 torr,

whereby effective heat transfer by conduction is obtained between said surfaces of said wafer and mounting member due to the presence of said conductive gas in the short paths that exist between the urged-together surfaces while leakage of said gas into said high vacuum chamber is substantially inhibited by said clamping of said surfaces against one another, thereby to prevent said gas from influencing said treatment.

B1 4,636,207 (1157th)
DISPOSABLE GARMENT WITH BREATHEABLE LEG CUFFS
Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Reexamination Request No. 90/001,495, Apr. 21, 1988.
Reexamination Certificate for Patent No. 4,636,207, issued Jan. 13, 1987, Ser. No. 522,438, Aug. 11, 1983.
Continuation-in-part of Ser. No. 441,825, Nov. 15, 1982, abandoned.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—370

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

New claims **4–11** are added and determined to be patentable.

1. A disposable diaper comprising [a liquid permeable topsheet,] a liquid impermeable backsheet, *a liquid permeable topsheet secured to said backsheet,* and an absorbent element interposed [therebetween] *between said topsheet and said backsheet;* said diaper having two lateral end margins and two longitudinal side margins; said longitudinal side margins being contoured in that said side margins are non-linear over at least a portion of their respective lengths; said diaper further having two longitudinally extending *breathable* cuffs adapted to contact the legs of a wearer when said diaper is in use; each of said cuffs comprising *a side flap extending outwardly from and along* at least a portion of [one] *each* of said longitudinal side margins; *of said absorbent element in at least a portion of said diaper, each of said side flaps having an outer surface, an inner surface, and a distal edge spaced outwardly from said longitudinal side margin of said absorbent element and forming said longitudinal side margin of said diaper;* each of said cuffs having been rendered elastically contractible by the association therewith of elastic means affixed to said diaper; wherein each of said cuffs is permeable to vapor over at least a portion of its extent, each of said cuffs comprises at least one separate element affixed to said diaper, *said separate element of said cuff comprising said outer surface of said cuff;* each of said cuffs comprises at least one portion permeable to vapor and at least one portion impermeable to vapor; and wherein in each cuff at least one portion permeable to vapor is intermediate the distal edge of said cuff and said adsorbent element and at least one portion impermeable to vapor is intermediate said portion permeable to vapor and said absorbent element, and the portion permeable to vapor comprises from about 5% to about 75% of said cuff.

B1 4,704,621 (1158th)
PRINTING DEVICE
Robertus van Cooten, Grubbenvorst; Dick Simons, Venlo; Bontko Witteveen, Venlo; Willem T. Draai, Venlo; Johannes G. V. van Striphout, Beek en Donk, and Martinus J. Huijben, Grubbenvorst, all of Netherlands, assignors to OCE-Nederland B.V., Venlo, Netherlands
Reexamination Request No. 90/001,743, Apr. 3, 1989.
Reexamination Certificate for Patent No. 4,704,621, issued Nov. 3, 1987, Ser. No. 825,044, Jan. 31, 1986.
Claims priority, application Netherlands, Feb. 6, 1985, 8500319
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—153.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2** and **14–16** are cancelled.

Claims **1**, **3**, **5**, **8**, **11**, **13**, **17**, **18** and **19** are determined to be patentable as amended.

Claims **4**, **6**, **7**, **9**, **10** and **12**, dependent on an amended claim, are determined to be patentable.

1. A printing device comprising a moveable image-forming medium on a support, the surface of which forms a dielectric layer; an image-forming station disposed along the trajectory of the image-forming medium having a magnetic roller with an electrically conductive nonmagnetic outer sleeve with magnets disposed inside the sleeve; a means for supplying electrically conductive toner particles to a linear zone in the image-forming station; and a plurality of electrodes for generating an electric field corresponding to a desired image pattern, said

electrodes extending in the direction of movement of the image-forming medium and disposed so as to be insulated from one another and covered by a dielectric layer wherein each electrode can be actuated by a voltage source [and] *by means of induction electrodes which are placed in registration with the electrodes on the image-forming medium, said induction electrodes being in trailing contact with the dielectric layer such that* each electrode can generate an electric field across the dielectric layer over part of the zone wherein image formation takes place when in the image-forming station.

REISSUES

NOVEMBER 14, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,110

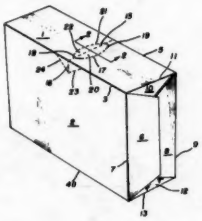
CARRYING HANDLE FOR A CAN CARTON

Prentice J. Wood, Hapeville, and Erwin Doerr, Dunwoody, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Original No. 46,536,86, dated Mar. 31, 1987, Ser. No. 851,533, Apr. 14, 1986. Application for reissue Aug. 15, 1988, Ser. No. 232,001

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—117.13 **9 Claims**



9. A carrying handle for a carton formed from a unitary blank for packaging a plurality of cans and having interconnected top, bottom and side walls and end closure panels, said handle comprising a perforated slit formed in and extending transversely in said top wall, a first transverse handle flap struck from said top wall and foldably joined thereto by a first fold line, and a second transverse handle flap struck from said top wall and foldably joined thereto by a second fold line, said first and said second fold lines being of arcuate configuration and said perforated transverse slit defining coincidental transverse edges of both of said handle flaps.

Re. 33,111

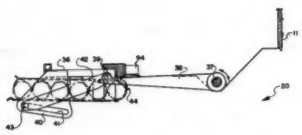
METHOD AND APPARATUS FOR AUTOMATICALLY DOFFING AND DONNING TAKE-UP PACKAGES ON A WINDER

Kurt W. Niederer, Charlotte, N.C., assignor to Belmont Textile Machinery Company, Belmont, N.C.

Original No. 4,591,105, dated May 27, 1986, Ser. No. 597,636, Apr. 6, 1984. Application for reissue May 26, 1988, Ser. No. 199,117

Int. Cl.[4] B65H *67/04*

U.S. Cl. 242—18 A **34 Claims**



1. In a strand processing machine for winding a strand from a strand supply source onto a take-up package, a yoke having a chuck for holding the take-up package, a drive roll for driving the take-up package to thereby wind the strand thereon, a guide for guiding the strand onto the take-up package in a pre-determined pattern, means for stopping yarn feeding and rotation of the drive roll, a strand cutter for cutting the stationary strand from the take-up package to be doffed and a conveyor for receiving a full take-up package from the yoke and moving it to a discharge point, the improvement which comprises a positive control apparatus for doffing a full take-up package from and donning an empty take-up package onto the yoke, said doffing and donning apparatus comprising:

(a) means for pivoting the yoke away from the drive roll under positive control to the conveyor;

(b) means for depositing the full take-up package on the conveyor;

(c) means for returning the empty chuck of the yoke to a donning position in closely spaced-apart relation from the driving position of the empty take-up package against the drive roll;

(d) means for moving an empty take-up package to the chuck of the yoke at its position in said closely spaced-apart relation from the driving position against the driving roll whereupon the empty take-up package is donned into the chuck of the yoke; and

(e) means for attaching the free end of the strand to be wound onto the take-up package in said closely spaced-apart relation from the driving position of the take-up package against the drive roll;

whereby the strand remains relatively taut as the take-up package moves into contact with the drive roll is not susceptible to tangling or being jerked by the take-up package as winding starts.

14. In a strand processing machine for winding a strand from a strand supply source onto a take-up package, a yoke having a chuck for holding the take-up package, a drive roll for driving the take-up package in a driving position to thereby wind the strand thereon, magazine means for receiving and holding a plurality of empty take-up packages for being donned onto the chuck of the yoke, the improvement which comprises an apparatus for donning an empty take-up package onto the yoke, said donning apparatus comprising:

(a) means for moving an empty chuck of the yoke to a donning position in closely spaced-apart relation from the driving position of the empty take-up package against the drive roll;

(b) means for moving the magazine means to the chuck of the yoke at the donning position in said closely spaced-apart relation from the driving position against the drive roll whereupon one of the empty take-up packages in the magazine means is donned into the chuck of the yoke in closely spaced-apart relation from the drive roll; and

(c) means for attaching a free end of the strand to be wound onto the take-up package in said closely spaced-apart relation from the driving position of the take-up package against the drive roll; whereby the strand remains relatively taut as the take-up package moves into contact with the drive roll and is not susceptible to tangling or being jerked by the take-up package as winding starts.

Re. 33,112

APPARATUS FOR HOUSING AND DEPLOYING A RADAR DETECTOR IN AN AUTOMOTIVE VEHICLE

Timothy N. Durham, Rte. 8, Box 153, Conway, S.C. 29526

Original No. 4,684,164, dated Aug. 4, 1987, Ser. No. 923,415, Oct. 27, 1986. Application for reissue Jul. 8, 1988, Ser. No. 216,778

Int. Cl.[4] B60R *7/04*

U.S. Cl. 296—37.7 **10 Claims**

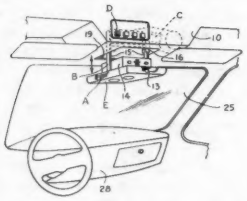
8. Apparatus for housing an electronic device in a stored, con-

cealed position behind an exposed inner surface of a vehicle and for deploying the electronic device in an operable position, comprising:

a support for the electronic device;

means for carrying the support for movement from the stored position to the operable position;

electrically operated means for moving said means carrying said support from the stored position to the operable position and for returning the support to the stored position; and



switch means for actuating the electrically operated means for moving the support from the stored position to the operable position and back again, the switch means automatically actuating said electrically operated means in response to a change in the operating condition of the vehicle;

whereby said electronic device may be readily moved and stored out of sight when the vehicle is not in operation and returned to operable position.

Re. 33,113

PRESSURE SENSITIVE RECORDING PAPER

Masataka Kiritani; Hiroharu Matsukawa, both of Fujinomiya, and Masayuki Aoki, Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

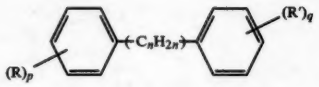
Original No. 3,836,383, dated Sep. 17, 1974, Ser. No. 193,151, Oct. 27, 1971. Application for reissue Sep. 17, 1976, Ser. No. 724,186

Claims priority, application Japan, Oct. 27, 1970, 45-94877

Int. Cl.[4] B41M *5/16, 5/22*

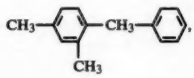
U.S. Cl. 503—213 **7 Claims**

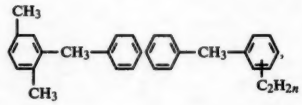
1. A pressure sensitive recording paper comprising a support having coated thereon a layer of color former, said color former dissolved in at least one compound represented by the following formula:

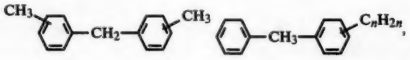


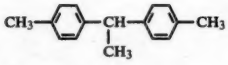
wherein n is an integer of 1 to 8, R and R' each represent a member selected from the group consisting of alkyl groups containing one to eight carbon atoms, and a hydrogen atom, p and q represent the number of alkyl groups, p+q being an integer of 1 to 3, and R and R' may be the same.

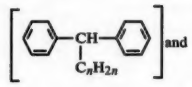
2. The pressure sensitive recording paper as claimed in claim 1, wherein said compound is a member selected from the group consisting of:

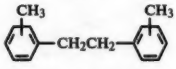












PLANT PATENTS

GRANTED NOVEMBER 14, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,055

MINIATURE ROSE PLANT 'MORJOYC'

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Calif.

Filed Oct. 3, 1988, Ser. No. 252,904
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded to upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of bright orange to orange red; the bud and flower resembling the variety Sheri Anne (U.S. Plant Pat. No. 3,826) in form; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy to matt foliage and an abundance of flowers borne both singly and in loose clusters of 3 to 5 or more.

7,056

AFRICAN VIOLET PLANT NAME WEST VIRGINIA

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Oct. 26, 1988, Ser. No. 262,578
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named West Virginia, as described and illustrated, and particularly characterized by its single, pink, wavy and frilled flowers with darker center radiating irregularly into the 2 small petals; dark pink line on the edges, especially of the two small petals; strong, upright flower stems that curve toward the center to form a compact bouquet above the leaves; dark green slightly serrated leaves, profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

PATENTS

GRANTED NOV. 14, 1989

ERRATA

For CLASS	See PATENT NO.
427-069	4,880,475
210-169	4,880,531
525-067	4,880,554
552-297	4,880,571
562-021	4,880,575
562-828	4,880,576
428-623	4,880,614
423-210	4,880,685
430-551	4,880,733
435-007	4,880,752
503-220	4,880,763
502-065	4,880,787
425-190	4,880,792
424-470	4,880,830
548-152	4,880,894
525-468	4,880,908
549-458	4,880,939
313-495	4,881,017
341-070	4,881,059
381-104	4,881,123
369-046	4,881,204
364-400	4,881,219
378-035	4,881,257

PATENTS

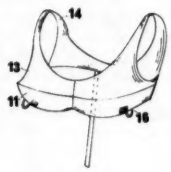
GRANTED NOVEMBER 14, 1989

GENERAL AND MECHANICAL

4,879,765
INFANT KNEE PAD
Daphne Baillie, and Brian Baillie, both of 129 Sylvan Avenue, Scarborough, Canada
Filed Sep. 27, 1988, Ser. No. 249,723
Claims priority, application Canada, Oct. 1, 1987, 548395
Int. Cl.[4] A41D *13/06*
U.S. Cl. 2—24 **8 Claims**

1. A child's knee pad comprising a forward pad and a rearward securing elasticized strap having a width of about ¼ to ½ of the length of the pad which is somewhat oval shaped with a convex inner and a concave outer surface and thinning downwardly in thickness for preshaping and fitting to a child's knee.

4,879,766
BRASSIERE AND/OR ATTACHMENT
Harold L. Hull, 401 Sp. 43, Sparks, Nev. 89431, and Althea P. Tafte, 2760 S. Virginia, Sp. 17, Reno, Nev. 89502
Filed Mar. 7, 1988, Ser. No. 164,802
Int. Cl.[4] A41C *3/00*
U.S. Cl. 2—101 **4 Claims**



1. A brassiere comprising;
(a) a front section having a pair of breast supporting cups;
(b) a pair of shoulder strap portions;
(c) a back section;
(d) a plurality of loops fixed to the bottom edge of the front section suitable for the insertion of a thumb or finger and
(e) a pull strap affixed to substantially the center of the said back section with its free end being free of all obstructions to allow said end to be tucked underneath the side or front edge of the brassiere and being of sufficient length to enable the wearer to reach it and to pull said brassiere into place.

4,879,767
DRESSES FOR WOMEN
Diane Hart, Flat 10, 156 Southerland Avenue, London W9 1HP, United Kingdom
Filed Nov. 13, 1987, Ser. No. 120,136
Claims priority, application United Kingdom, Nov. 14, 1986, 8627277
Int. Cl.[4] A41D *27/00*
U.S. Cl. 2—243 B **13 Claims**

1. A method of making a dress for a woman comprising the steps of:
(a) obtaining from a prospective wearer of said dress circumferential vertically spaced measurements at levels of the bust, the waist and the hips and longitudinal measurements taken from the shoulder to the waist at the rear, from the shoulder to the waist over the bust, from the waist to the underbust level, from the waist to the floor and from the waist to a chosen hem level;
(b) providing pre-cut panels of dresses to be made from said measurements of prospective wearers in a plurality of basic sizes, each basic size being furnished as a plurality of panels of varied lengths and widths and each panel having an edge extending parallel with waist level for seaming to a corresponding edge extending parallel with waist level of an adjacent panel which is disposed at a significant spacing from waist level;
(c) utilising said measurements obtained from a prospective wearer to select for the dress to be made from said panels provided, panels in the correct basic size and of width and length best suited to said obtained measurements; and
(d) seaming together said selected panels to form a dress in accordance with said obtained measurements.

4,879,768
NON-SLIP STRAP PAD
David L. McClees, Lewiston, Me.; John S. McClees, Jr., Towson, Md., and Michael P. McConnell, Durham, N.H., assignors to Talus Corp., Lewiston, Me.
Filed May 4, 1988, Ser. No. 190,132
Int. Cl.[4] A41D *27/26*
U.S. Cl. 2—268 **18 Claims**

1. A shoulder strap assembly for carrying objects comprising a strap for attachment to the object to be carried and having a portion adapted to be positioned over the shoulder and external to the clothing of the user,
pad means on the underside of said strap for preventing the strap from slipping off the shoulder of the user and comprising a resiliently padded portion of wedge shape positioned at and immediately underlying the portion of the strap to be worn over the shoulder and external to the clothing of the user,

said wedge shape padded portion being such that the thick edge of the wedge is worn to the outside and the thin edge of the wedge to the inside relative to the shoulder of the wearer,

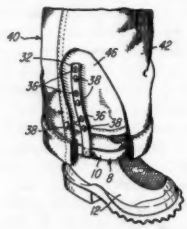
said wedge-shaped padded portion being of foam rubber or plastic and substantially the same width as said strap, and the height of said wedge being such as to increase the plane of the user's shoulder to a plane level with the ground or inclined from neck to shoulder.

4,879,769

FIREFIGHTER'S BOOT AND TROUSER ATTACHMENT

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

Filed Jul. 5, 1988, Ser. No. 215,300
Int. Cl.[4] A41F *9/00*
U.S. Cl. 2—312 **10 Claims**



1. For use with a firefighter's boots and firefighter's trousers, as the firefighter's trousers normally cover a significant part of the firefighter's boots, an attachment device comprising a band which is adapted to encompass a firefighter's boot, strap means connected to the band and extending from the band, fastener means carried by the strap means, complementary fastener means carried by the firefighter's trousers and releasably attachable to the fastener means carried by the strap means, the attachment device thus attaching the firefighter's trousers, to the firefighter's boot.

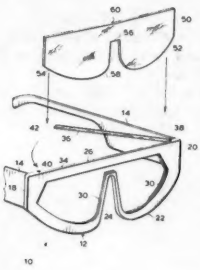
4,879,770

EYEWEAR

Steven J. Vacilotto, 22 North Park Drive, North York, Canada M6L 1K2

Filed Nov. 2, 1987, Ser. No. 115,794
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—441 **10 Claims**

1. Eyewear of a type supported by temples comprising:
a unitary lens, and
a hard frame comprising opposed side portions and a nose portion bridging between said portions, the inner periphery of said side portions and said nose portion having a continuous channel extending therealong;
said frame further including a top member interconnecting said side portions adjacent their upper ends, at least a portion of said top member being movable between a first position wherein said channel is open along its length so as



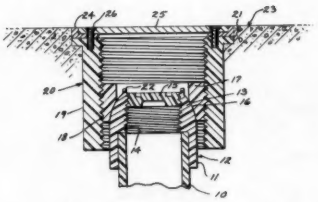
to permit said lens to be inserted into said channel, and a second position wherein said top member portion acts to lock said lens into said channel.

4,879,771

FLOOR CLEAN-OUT ASSEMBLY

James Piskula, P.O. Box 26174, Milwaukee, Wis. 53226

Filed Feb. 29, 1988, Ser. No. 161,800
Int. Cl.[4] E03F *5/04*
U.S. Cl. 4—191 **1 Claim**



1. A floor clean-out assembly for a drain pipe comprising:
a tubular adapter having a central lumen extending therethrough, said adapter having a bottom for connection to a drain pipe and a top shaped to serve as the ball of a ball and socket; and, an extension means open at both ends and having a central lumen extending therethrough, said extension means having a socket adjacent one end for the top of the adapter and means at the other end to receive a floor plate to close said lumen, said extension means being comprised of a collar which has said socket at its bottom and a threaded exterior; and, a sleeve which has a threaded interior at one end which mates with the threaded exterior of the collar so that the sleeve can be turned and moved vertically along said collar to adjust the other end of the sleeve to the height of a floor.

4,879,772

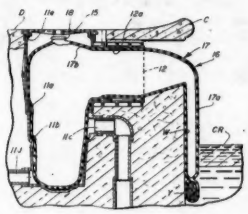
DEVICE FOR CLOSING OFF A POOL SKIMMER

David M. Meloney, Jr., 857 Killarney Pass, Mundelein, Ill. 60060

Filed Oct. 13, 1987, Ser. No. 108,101
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—506 **6 Claims**

1. A device in combination with a pool having a skimmer to close off an interior portion of the skimmer when the pool is to be shut down for a prolonged period of time and the surface of the water within the pool is beneath a predetermined level; said skimmer comprising a housing mounted adjacent to but re-

cessed from an exposed side wall surface of the pool and having an interior portion provided with a first segment communicating with the water surface when at the predetermined level and a second segment communicating with said first segment and disposed beneath said predetermined water level, a surface skimming inlet extending substantially laterally from said exposed side wall surface and communicating with the first segment whereby, when the pool water surface is at said predetermined level there is flow of surface water through said surface skimming inlet into said housing interior portion first segment



through the second segment and out through a pump suction outlet port communicating with the second segment; said device comprising an inflatable member formed of a pliable, expansible waterproof material, said member, when in a deflated condition, being positioned within said skimmer housing interior portion, and when subsequently inflated substantially occupying and conforming to the configuration of the housing interior portion and effecting sealing off the inlet from the outlet port; and valve means carried on said inflatable member for controlling inflating and deflating of said member.

4,879,773

SHOWER CABINET

Nils R. Bergmark, Ringvägen 14, S-930, 47 Byske, Sweden

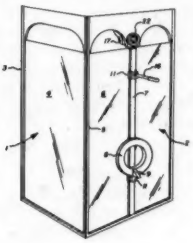
PCT No. PCT/SE87/00414, § 371 Date May 11, 1988, § 102(e) Date May 11, 1988, PCT Pub. No. WO88/01843, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 14, 1987, Ser. No. 149,570

Claims priority, application Sweden, Sep. 16, 1986, 8603903

Int. Cl.[4] A47K *3/22*

U.S. Cl. 4—612 **12 Claims**



1. A shower cabinet including a substantially floor length vertical opening means for ingress and egress therefrom, said shower cabinet comprising:

pivotable door screen means operable to allow said ingress or egress, said door screen means including stiffening strip means formed along a vertical center line of at least one face of said screen means;

said stiffening strip means comprising pivotal support means for pivotally attaching said door screen means on a vertical axis at its center whereby said door screen means are operable to rotate substantially **180** degrees on said axis, said axis disposed within said full length vertical opening means, and;

said stiffening strip means further comprises selectable seat means disposed on said strip means.

4,879,774

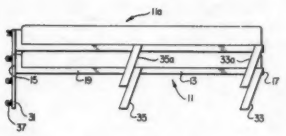
NESTABLE BED

Herbert A. Sanders, 8904 Crosswind Dr., Fort Worth, Tex. 76179

Filed Jan. 19, 1988, Ser. No. 145,573

Int. Cl.[4] A47C *19/00/21/00*

U.S. Cl. 5—8 **14 Claims**



1. A set of beds, which comprises:

a plurality of rectangular frames, each of said frames being adapted to receive a mattress, each frame defining a plane having a longitudinal axis and a transverse axis;

a pair of first legs mounted to a first end of each frame, said first legs lying in a plane perpendicular to said longitudinal axis, said first legs being unparallel to each other;

a pair of second legs mounted spaced apart from each other on opposite sides of each frame, said second legs lying in spaced apart planes perpendicular to said transverse axis, said second legs being nonperpendicular to the plane defined by said frame;

and a mattress carried by each of said frames;

wherein said frames are stacked on top of each other with their ends and sides coincident with each other and their mattresses in close proximity to each other.

4,879,775

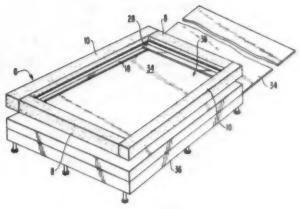
REINFORCED RAIL ASSEMBLY FOR WATERBEDS

Donald W. Keefer, Pasadena, Md., assignor to Classic Corporation, Jessup, Md.

Continuation-in-part of Ser. No. 70,125, Jul. 6, 1987, Pat. No. 4,771,491, which is a continuation of Ser. No. 906,610, Sep. 10, 1986, abandoned, which is a continuation of Ser. No. 775,015, Sep. 11, 1985, abandoned. This application Apr. 22, 1988, Ser. No. 185,006

Int. Cl.[4] A47C *19/00, 27/08*

U.S. Cl. 5—400 **9 Claims**



1. An assembly forming reinforced waterbed walls comprising:

a plurality of cushions defining outer walls of a waterbed when assembled, each cushion having an inner face, a top face and a bottom face; and

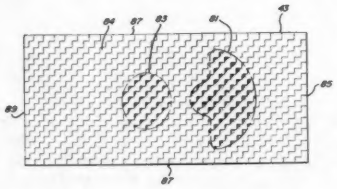
a reinforcing bar positioned adjacent each cushion, each reinforcing bar having first, second and third members, said first member extending into said cushion from said inner face at a position intermediate said top and bottom faces, said second member extending from said first member along said inner face, and said third member extending from said second member away from said cushion and oriented substantially coplanar with said bottom face.

4,879,776

ANATOMICALLY CONFORMABLE FOAM SUPPORT PAD

David L. Farley, 18672 Evergreen Ave., Yorba Linda, Calif. 92686

Filed Apr. 4, 1988, Ser. No. 176,925
Int. Cl.[4] A47C *27/14*
U.S. Cl. 5—436 **20 Claims**



9. A convoluted foam pillow for supporting the head and neck of a body, comprising:

a bottom;

a general support area formed by peaks arranged in rows, wherein each peak has a substantially flat top and is spaced from any adjacent peak in the same row by a valley; and

a generally T-shaped head and neck support area formed by peaks arranged in rows, wherein each peak has a substantially flat top and is spaced from any adjacent peak in the same row by a valley, wherein each of said peaks has a substantially uniform peak thickness said valleys of said general support area and said valleys of said head and neck support area each having an average valley thickness, wherein said average valley thickness of said valleys in said head and neck support area is less than said average valley thickness of said valleys in said general support area, thereby forming an area of greater capacity to conform to the shape of said head and said neck of said body.

4,879,777

FLUIDIZED PATIENT SUPPORT SYSTEM

Vernon L. Goodwin, Charlotte, N.C., assignor to Support Systems International, Inc., Charleston, S.C.

Continuation of Ser. No. 62,176, Jun. 12, 1987, Pat. No. 4,776,050, which is a continuation of Ser. No. 796,780, Nov. 12, 1985, Pat. No. 4,672,699, which is a division of Ser. No. 571,557, Jan. 17, 1984, Pat. No. 4,564,965. This application Jun. 8, 1988, Ser. No. 204,204
The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.
Int. Cl.[4] A47C *27/08, 31/02*
U.S. Cl. 5—453 **4 Claims**

1. An improved mobile patient support system, comprising:

(a) a generally oval shaped tank having a bottom wall, side walls, and an open top, said side walls having a contoured upper rim that extends laterally outward therefrom to a maximum dimension that is less than the width of a passageway through which said system is designed to be used;

(b) a wheeled support housing received beneath said tank and being secured thereto;

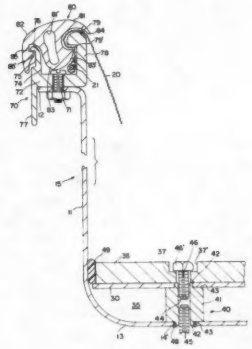
(c) fluid diffuser means received within said tank and spaced above said bottom wall;

(d) a plenum chamber defined beneath and in fluid communication with said fluid diffuser means;

(e) a mass of granular material received within said tank atop of said fluid diffuser means;

(f) fluid pressure generating means in communication with said plenum chamber, said fluid pressure generating means being actuatable for generating fluid pressure within said plenum chamber adequate to diffuse through said fluid diffuser means and fluidize said granular material atop of said fluid diffuser means sufficient to support a patient thereon;

(g) a flexible sheet removably secured about said upper rim



of said tank, said flexible sheet being porous to the passage of fluid and impervious to the passage of said granular material; and

(h) a resilient rim cover nondestructively removable and securable by hand unaided by any tool about said upper rim of said tank for securing said flexible sheet, said resilient rim cover having a generally smooth upper surface; said resilient rim cover having a lower surface contoured for snap fitting engagement with said contoured upper rim and for receiving said flexible sheet between said contoured upper rim and said rim cover without extending through said sheet; said rim cover cooperating with said upper rim to retain said flexible sheet therebetween with adequate force to prevent the weight of the patient from pulling said flexible sheet from between said contoured upper rim and said resilient rim cover when said granular material is in a fluidized or a non-fluidized state.

4,879,778

HEEL MOLDER

Michael M. Becka, Nashua, and William Walega, Hollis, both of N.H., assignors to International Shoe Machine Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 186,417, Apr. 26, 1988, abandoned. This application Dec. 2, 1988, Ser. No. 278,983
Int. Cl.[4] A43D *11/00*
U.S. Cl. 12—146 D **8 Claims**

1. A method of heel molding of a footwear upper assembly that includes a last, a footwear upper draped about the last and an insole disposed on the last bottom, to form the heel part of the upper having a margin that extends outwardly from the insole, the heel part of the upper including a thermally-activated material that is deformable when heated above a threshold temperature and relatively non-deformable below the threshold temperature, said thermally-activated material

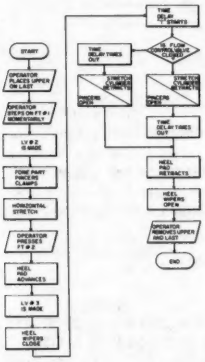
having a thermally-activated adhesive on each major surface thereof, said method comprising the sequential and somewhat overlapping steps:

receiving the upper assembly with a preheated upper thereon by a spindle;

pressing the last with the preheated upper thereon firmly onto the spindle;

grasping the upper at its toe or forward region and drawing the preheated upper on the toe direction of the footwear upper assembly to stretch the heel part of the heated upper about the heel portion of the last;

while the heel part of the upper is thus stretched about the heel portion of the last, applying a pad adapted to exert a substantially uniform pressure to form or shape the upper about the heel portion of the last and the shank portion of the last;



wiping the heel part of the heated upper while the pad is in engagement with clamping the heel part of the upper against the last, to press the margin onto the insole whereby the thermally-activated material and heel part of the upper and other parts of the heel region of the preheated upper are forced into intimate contact with last, pad and wiping mechanism to cause the thermally-activated material and other upper parts to adhere to each other forming a laminated structure and to cool sufficiently for said laminated structure to take a permanent preformed set to a shape induced by conformity to the last; and

applying bedding pressure operable to apply high bedding force between the wiped margin and the wipers and sufficient to overcome the inherent mechanical memory of the upper to achieve sharp molding definition, i.e., a sharp edge between the side of the upper and the wiped margin thereof.

4,879,779

DEVICE FOR CLEANING A COOKING GRATE

Harvey A. Zalevsky, R.D. #2 Box 267E, Export, Pa. 15632, and David A. Leah, P.O. Box 10971, Irvine, Calif. 92702

Filed Oct. 11, 1988, Ser. No. 255,704
Int. Cl.[4] A47L *17/00*
U.S. Cl. 15—104.92 **14 Claims**

1. A device for cleaning cooking by-products from a cooking grate having a predetermined thickness with a cleaning fluid, said device comprising:

a container having an interior cavity and an open top which are both dimensioned to receive the cooking grate;

said container being for containing the cleaning fluid within said interior cavity to a level adjacent said open top for substantially immersing the cooking grate;

said container having a pair of parallel side wall means;

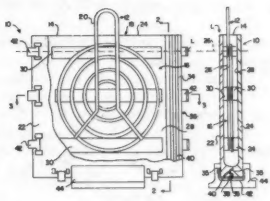
said pair of said parallel side wall means having interior surfaces at least partially defining said interior cavity;

said interior surfaces being separated by a predetermined distance greater than said predetermined thickness for receipt of said cooking grate therebetween;

at least one of said interior surfaces having resiliently deflectable abrasion means mounted thereon;

said resiliently deflectable abrasion means of said at least one of said interior surfaces extending into said interior cavity toward the other of said interior surfaces for scrubbing the cooking by-products from the cooking grate;

said resiliently deflectable abrasion means including a plurality of resiliently deflectable elements having abrasive surface portions which are located outwardly of said at least one of said interior surfaces and within said interior cavity;



said each of said resiliently deflectable elements being elongated and extending across said at least one of said interior surfaces and being separated, by spaces within said interior cavity, from adjacent ones of said plurality of said resiliently deflectable elements on the same interior surface;

said spaces comprising means for collecting the cooking by-products being dislodged from said cooking grate by said resiliently deflectable elements;

said spaces being between said resiliently deflectable elements of said plurality;

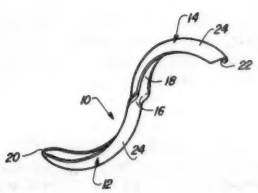
means for selectively separating said side wall means for exposing said interior surfaces and said resiliently deflectable abrasion means thereof for cleaning away the dislodged cooking by-products adhering thereto.

4,879,780

S-SHAPED JOINTER TOOL WITH SYMMETRIC BLADE AND HANDLE

Alfreda J. Prebeck, 38105 Reimold, Mt. Clemens, Mich. 48045

Continuation of Ser. No. 111,853, Oct. 23, 1987, abandoned.
This application Mar. 28, 1989, Ser. No. 329,458
Int. Cl.[4] E04G *21/20*
U.S. Cl. 15—105.5 **1 Claim**



1. A jointer tool for smoothing martar joints between rows of bricks:

said jointer tool being comprised solely by two identical but reversed convexly arcuate sections;

each section having an inner end and an outer end, said inner

ends meeting and being directly connected to each other at a common point of tangency at a middle of the tool such that said sections form a pair of connected, continuously curved and oppositely placed smooth surfaces;

said inner ends including outwardly flared opposed arcuate side portions which extend laterally from the convexly arcuate sections;

each section having a uniform circular segment cross-section throughout its length;

each convexly arcuate section having an identical circular radius for forming an S-shaped tool with the sections being symmetrical to each other, but reversed, about said common point of tangency;

the outer end of each section is rounded so that a point of contact between the tool and mortar joint can reach an outer end of a section during pivoting of the tool without marring the mortar joint being smoothed;

said outer ends of said arcuate sections being disposed on a straight line passing through said common point of tangency;

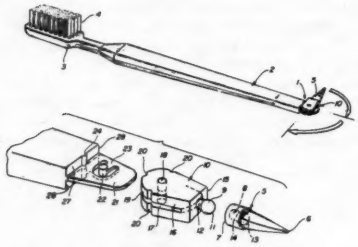
such that each arcuate section of the tool is used as a handle and a working blade and said tool being pivoted by wrist movement of the user as the tool is swung in an arc so that the point of tool contact with a mortar joint being smoothed moves outward along the convexly arcuate section being used as a working blade toward the outer end of the section as the tool is moved along the joint.

4,879,781

TOOTHBRUSH WITH POSITIONABLE STIMULATOR TIP

Joseph A. Desimone, Bricktown, N.J., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Filed Aug. 19, 1988, Ser. No. 234,247
Int. Cl.[4] A61H *13/00*
U.S. Cl. 15—110 **16 Claims**



1. In a toothbrush having a handle and an interdental device rotatably attached to said handle, the improvement wherein:

(a) said device is mounted for rotation about an axis which is movable between a first position and a second position; and

(b) positioning means are provided which hold said device in a predetermined orientation when said axis is in said first position and permits movement of said device when said axis is in said second position.

4,879,782

BLIND CLEANING DEVICE

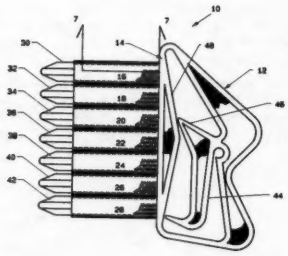
Jeff A. Jacobson, 409 Emerald Bay, Laguna Beach, Calif. 92651

Filed Jan. 19, 1988, Ser. No. 144,967
Int. Cl.[4] A47L *4/02*
U.S. Cl. 15—210 A **7 Claims**

1. A blind cleaning device comprising:

a mounting bar member;

at least one axially-extending finger member mounted to and projecting from said mounting-bar member, said finger member having an integral detent means on an end which is remote from said mounting-bar member for releasably retaining a cleaning roller in operative position on said finger member, said finger member being adapted to slideably and rotatably support a generally-cylindrical axially-hollow cleaning roller in a frictional fit, said finger member being longer than said cleaning roller and being adapted to extend axially through said cleaning roller, and means for accommodating a wide variation in tolerance between said finger and cleaning roller without substantially changing said frictional fit; and



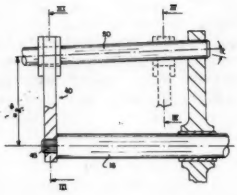
means for grasping mounted to said mounting-bar member.

4,879,783

DEVICE, ESPECIALLY RECIPROCATING STROKE WIPER SYSTEM FOR MOTOR VEHICLES

Bruno Egner-Walter, Heilbronn; Eckhardt Schmid, Brackenheim, and Wolfgang Scholl, Gemmrigheim, all of Fed. Rep. of Germany, assignors to ITT SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP87/00668, § 371 Date Jun. 30, 1988, § 102(e) Date Jun. 30, 1988, PCT Pub. No. WO88/03487, PCT Pub. Date May 19, 1988
PCT Filed Nov. 4, 1987, Ser. No. 223,203
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638073
Int. Cl.[4] B60S *1/26*
U.S. Cl. 15—250.21 **4 Claims**



1. A device, especially a reciprocating stroke wiper system for motor vehicles, comprising a piston which is movably guided in a housing for movement along the axis thereof, and a projecting arm fixed on said piston and protected against twisting, said projecting arm radially projecting from this piston and enclosing a guiding element fixed at a certain distance of the piston housing, guiding areas of the guiding element and of a guiding fork gliding along each other during the motion of the piston, the guiding area on the guiding element being smaller than on the guiding fork and the distance between the effective guiding areas and the axis of the piston changing during the motion.

4,879,784

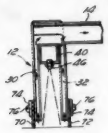
BI-DIRECTIONAL SQUEEGEE JET WAND

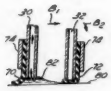
William Shero, 30961 Steeplechase, San Juan Capistrano, Calif. 92675

Continuation of Ser. No. 900,769, Aug. 26, 1986, abandoned. This application Aug. 9, 1988, Ser. No. 230,071

Int. Cl.[4] A47L 7/00, 9/02

U.S. Cl. 15—322 8 Claims





1. An improved cleaning wand for use in cleaning floors comprising:

a vacuum head having front and rear vacuum ports directed generally at right angles to said floor;

means disposed between said front and rear vacuum ports for spraying a cleaning solution upon a floor surface;

a handle cooperating with said vacuum head to manipulate said vacuunm head in a forward and reverse direction upon the floor surface, said handle being further adapted to alternately tilt said vacuum head in said forward and said reverse directions as the operator manipulates said vacuum head in such directions; and

at least one squeegee blade positioned outside of and adjacent to at least one of said vacuum ports, each such squeegee blade being directed downwardly from said vacuum head and terminating at a point below said vacuum ports and said means for spraying cleaning solution such that when said vacuum head is in its operative position said squeegee blade(s) will be in direct contact with said floor, with said vacuum ports and said means for spraying cleaning solution being held above said floor, said squeegee blade(s) being further adapted to assume an angular configuration of approximately ninety degrees thereby blocking said adjacent vacuum port upon movement of said vacuum head in the direction of each such squeegee blade.

4,879,785

SWIVEL BEARING FOR A DOOR-HOLDING ROD FOR A DOOR-HOLDING DEVICE FOR MOTOR VEHICLES

Karl-Heinz Tölle; Heinz-Walter Heinemann, both of Wuppertal; Jürgen Brockhaus, Remscheid, and Wolfgang Fiebrich, Halver, all of Fed. Rep. of Germany, assignors to ED. Scharwächter GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

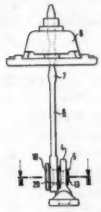
Filed Jul. 15, 1988, Ser. No. 220,017

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723424

Int. Cl.[4] E05C 17/04; E05D 5/10

U.S. Cl. 16—82 13 Claims

1. A door-holding device for motor vehicle doors, comprising a door-holding rod having first and second ends, a carrier member attached to a structural door component, the first end of the door-holding rod freely swivelably connected to the carrier member, the second end of the door-holding rod extending through a holder housing mounted on another structural door component door or door post, the door-holding rod having along its length increased thickness portions protruding outwardly transversely of the longitudinal direction of the door-holding rod, the door-holding rod and the carrier member defining openings, a bolt having an axis extending through the openings of the door-holding rod and of the carrier member, so that the door-holding rod is freely swivelable relative to the bolt, while the carrier member is non-rotatable relative to the bolt, the carrier member formed by a single shaped piece, the bolt having a head, a spring mounted between the head of the bolt and the carrier member, the bolt having a shaft portion with smooth running surfaces, a conical clutch-type, axially



and radially acting means for supporting the door-holding rod on the smooth running surfaces of the bolt, wherein the support of the door-holding rod on the smooth running surfaces is automatically centering and free of play and wherein the axially and radially acting means include corresponding conically widening portions provided on the opening of the door-holding rod and on the shaft portion of the bolt.

4,879,786

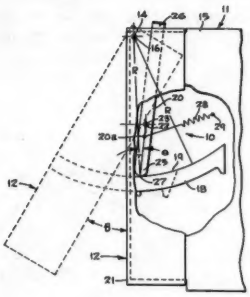
LOW PROFILE TILT LOCK MECHANISM WITH PIVOTABLE LOCKING LINK TO ENGAGE CAM SURFACE

Robert N. Olson, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1988, Ser. No. 179,150

Int. Cl.[4] E05C 17/64; E05D 11/08

U.S. Cl. 16—341 5 Claims



1. A tilt lock mechanism for a pivotable panel assembly comprising a base member and at least one panel element mounting on the base member for pivotable movement about an axis generally perpendicular to adjacent faces of the base member and the panel element, the tilt lock mechanism comprising:

the axis including a first pivot pin mounted on the base member to define a first pivot axis member;

the at least one panel element mounted on the base member for movement about the first pivot axis;

a cam surface rigidly mounted on the panel element and disposed for movement adjacent the base member;

a second pivot pin mounted on the base member and displaced from the first pin, the second pivot pin defining a second pivot axis;

a locking link mounted on the second pivot pin, the link

having a first end portion disposed for engagement with the cam surface and a second portion exterior of the base member selectively moveable in a direction to release the locking; and

a biasing member connected between the locking link and the base member, to urge the locking link in a first direction and into engagement with the cam surface, to lock the panel assembly in a selected position, the biasing member being movable in an opposite direction to release the locking link from engagement with the cam surface and permit the panel assembly to freely move about the first pivot axis.

5. A method for tilting and locking a pivotable panel assembly comprising a base member and at least one panel element mounted on the base member for pivotable movement about an axis generally perpendicular to adjacent faces of the base member and the panel element, at a selected, tilted position, the tilt-lock method comprising:

defining a first pivot axis on the base member;

mounting the panel element on the base member for movement about the first pivot axis;

rigidly mounting a cam surface on the panel element for movement adjacent the base member;

defining a second pivot axis on the base member displaced from the first pivot axis;

mounting a locking link on the base member for movement about the second pivot axis, said link having a first end portion disposed for engagement with the cam surface and a second portion exterior of the base member selectively moveable in a direction to release the locking link;

connecting a biasing member between the locking link and the base member, to urge the locking link in a first direction and into engagement with the cam surface, to lock the panel assembly in a selected position, the biasing member movable in an opposite direction to release the locking link from engagement with the cam surface and permit the panel assembly to freely move about the first pivot axis.

4,879,787

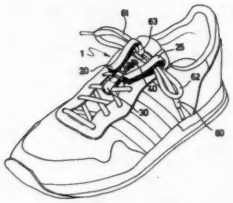
SHOE LACE KNOT SECURING DEVICE

Thomas J. Walls, 4201 E. Maple Manor, Muncie, Ind. 47302

Filed Oct. 3, 1988, Ser. No. 252,469

Int. Cl.[4] F16G *11/00*

U.S. Cl. 24—712.2 **53 Claims**



1. A shoe lace knot securing device comprising a body, a pair of straps each having two ends wherein one end of each strap is permanently attached to one end of the said body and the other end of each strap is free and wherein the said straps extend outward from the said end of the said body, and an anchor loop provide at the other end of the said body, wherein the said body is provided with a fastener adapted to coact with a fastener on each of the said straps to detachably couple the free end of each of the said straps to the said body, and wherein each of the said straps is provided with a fastener adapted to coact with a fastener on the said body to detachably couple the free end of each of the said straps to the said body, and wherein each of the said straps is provided with a loop type fastener adapted to coact with shoe lace fibers to restrain movement of the lace.

4,879,788

DRAWING MACHINE

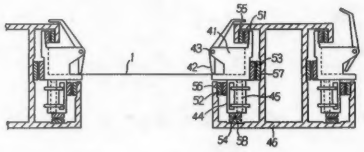
Tsutomu Suzuki; Tatsushi Seko; Kuniharu Tobita; Saburo Matsubayashi; Nobuhiko Kougo; Kiyoshi Ogawa, all of Nagoya; Susumu Taniguchi, Nagasaki; Masaharu Minami, Takasago; Masayuki Hayakawa, Nagoya, and Noriyuki Kawada, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 876,200, Jun. 19, 1986, abandoned. This application Aug. 17, 1988, Ser. No. 233,922

Claims priority, application Japan, Jun. 25, 1985, 60-138121; Aug. 19, 1985, 60-181280; Aug. 19, 1985, 60-181281; Aug. 23, 1985, 60-184016; May 8, 1986, 61-105534

Int. Cl.[4] D06C *3/04*

U.S. Cl. 26—94 **2 Claims**



1. A horizontal drawing machine for pinching the selvage edges of a web-like film, continuously laterally stretching the film in a crosswise direction, and releasing the film after stretching, said machine comprising:

rail means defining a film inlet section and a film outlet section, said rail means diverging from the film inlet section to the film outlet section;

a clip-propelling unit for driving a plurality of clip means along said rail means;

a plurality of clip means attached to said clip propelling unit for pinching the selvage edges of a web-like film and stretching the web-like film when said clip-propelling unit drives said plurality of clip means along said rail means from the film inlet section to the film outlet section;

first magnet means on said plurality of clip means;

second magnet means on said rail means in spaced opposed relation to said first magnet means;

said first magnet means repelling said second magnet means for opposing the weight of said plurality of clip means and the weight and stretching force of the web-like film pinched thereby for floating said plurality of clip means spaced from said rail means for eliminating abraded particles generated when said plurality of clip means moves along said rail means;

magnetically-actuated clips on each of said plurality of clip means, said magnetically-actuated clips being magnetically and mechanically actuatable;

magnetic clip opening and closing means disposed along said rail means, and said magnetic clip opening and closing means having third magnet means for opening and closing said magnetically-actuated clips for pinching and releasing the web-like film when said plurality of clip means is moved along said rail means; and

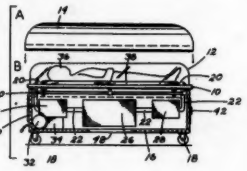
mechanical clip opening and closing means disposed along said rail means, said mechanical clip opening and closing means having a mechanical member for physically contacting said magnetically-actuated clips for opening and closing said magnetically-actuated clips for pinching and releasing the web-like film when said plurality of clip means is moved along said rail means and said magnetic clip opening and closing means has failed to open or close said magnetically-actuated clips.

4,879,789

MORTUARY DISPLAY PLATFORM

Donnell E. Bak, P.O. Box 443, Paradise, Calif. 95967

Filed Jun. 13, 1988, Ser. No. 205,649
Int. Cl.[4] A01N *1/00*
U.S. Cl. 27—11 8 Claims



1. A refrigerated mortuary display platform comprising:

a display platform;

said display platform being a substantially rectangular panel having horizontal surfaces faced upwardly and downwardly, said panel being of sufficient thickness and size to support a human cadaver laid on said upwardly faced surface lengthwise on a rectangular mattress pad, there being end space and side space for venting and for attachment of coverings, there being detachable pallbearer handles fastened to the sides of said display platform, rectangularly there being shaped air passage vent openings cut through said display platform adjacent the ends thereof, said air passage vent openings covered by hinged vent doors spring biased to maintain a closed sealed position except when forced open from below by an opening means;

a transparent dome being primary of said coverings;

said transparent dome configured substantially rectangularly, opened downwardly, having upwardly rounded corners to form said dome, and structured of clear viable material in a size to encompass said cadaver, said mattress pad, and said air vents and form a controlled environmental cavity thereabout, there being and edge-aligned grooved track in said upwardly faced surface of said display platform sized to fit and retain said downwardly opened side of said transparent dome, the downwardly edge thereof;

a wheeled housing base;

said wheeled housing base being a box-like structure opened upwardly and downwardly and having an opened c section, said wheeled housing base being sized to join with and support said display platform, there being rubberized wheels pivotally affixed one each adjacent the four corners under said wheeled housing base providing mobility and supporting the downwardly side of said wheeled housing base a minimum of six inches above floor level, said wheeling base affixed with electrical powering means with operational circuitry, and controlling means with operational circuitry operating a refrigerator unit, a dehumidifier unit, and an air purifying unit connected by air ducts inwardly turned and upwardly widened into insert shafts fitting inside said air passage vent openings in said display platform providing air passage into said controlled environment cavity inside said transparent dome with said refrigerator unit, said dehumidifier unit, and said air purifying unit with said air duct connections affixed in operational alignment inside said wheeled housing base, there being connected in said controlling means monitoring means with automatic adjustment controls for maintaining set humidity and temperature levels in said transparent dome;

a burial cover being secondary of said coverings;

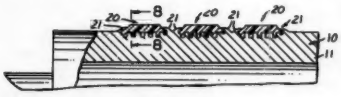
said burial cover opaque and of similar configuration to said transparent dome being sufficiently larger to encompass said transparent dome and having a downwardly opened side sized and shaped for the edges thereof to conform with and somewhat overlap in paralleling alignment the perimeter edging of said display platform, there being means for fastened said burial cover to said display platform with edge to edge alignment, the assemblage of said burial cover and said display platform with said display platform removed from said wheeled housing base providing a unitary burial container.

4,879,790

METHOD OF MAKING A PROJECTILE HAVING A DRIVING BAND

Harold E. Garrett, Santa Ana, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Continuation of Ser. No. 41,029, Apr. 20, 1987, abandoned, which is a division of Ser. No. 934,525, Nov. 24, 1986, Pat. No. 4,754,708. This application Sep. 2, 1988, Ser. No. 243,223
Int. Cl.[4] B21K *21/06*
U.S. Cl. 29—1.2 2 Claims



1. A method of fabricating a projectile for an ammunition round, including the steps of:

forming an elongated projectile;

knurling a plurality of longitudinally adjacent circumferential paths around the circumference of said projectile to form a plurality of circumferentially alternating longitudinal ridges and valleys;

bending pairs of circumferentially adjacent ridges toward each other forming therebetween a restraining region;

molding a plastic driving band around said projectile so said driving band is mechanically coupled to said projectile by the restraining regions; and

wherein the step of bending pairs of circumferentially adjacent ridges toward each other includes bending longitudinally adjacent portions of a first ridge in opposing directions thereby forming a plurality of hook means along said first ridge, adjacent ones of said hook means on said first ridge being curved in opposing circumferential directions, and longitudinally adjacent hook means on said first ridge partially defining circumferentially and longitudinally displaced restraining areas.

4,879,791

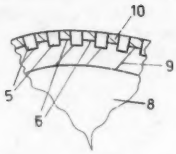
METHOD OF PRODUCING A PITTED ROLL FOR AN OFFSET LITHO PRINTING PRESS

Rolf Herb, Frankenthal, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Dec. 6, 1988, Ser. No. 280,443
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744131
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—148.4 D 11 Claims

1. A method of producing a pitted roll for use in an offset litho press inking unit and having an inner superficial layer of a material with an affinity for offset litho ink and thereon an outer superficial layer of ceramic material and with pits in the ceramic material, said method comprising the steps of firstly

coating a plain roll member with a material with an affinity for ink and then with ceramic material, whereafter the roll member is pit-engraved to penetrate the ceramic layer and to extend into the layer of material having an affinity for ink.

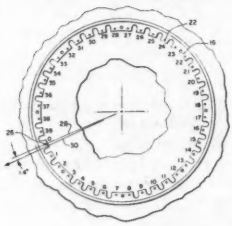


4,879,792

METHOD OF BALANCING ROTORS

Gerald J. O'Connor, Jupiter, Fla., assignor to UnitedTechnologies Corporation, Hartford, Conn.

Filed Nov. 7, 1988, Ser. No. 268,138
Int. Cl.[4] F16F *15/22*; B21K *3/00*
U.S. Cl. 29—156.4 R **6 Claims**



1. A method of balancing a rotor having a finite number of potential weight locations, using preselected class weights and limitation on the amount of weights to be used: rotating the rotor;

measuring the true initial unbalance magnitude and angle of the rotor unbalance;

calculating the applied unbalance magnitude and angle for each possible selection of weight classes and weight locations within said limitation;

determining a plurality of calculated residual unbalances by vector summing said initial unbalance magnitude and angle with each calculated applied unbalance magnitude and angle;

selecting the minimum value of said calculated residual unbalance magnitudes; and

installing the weights producing said minimum value at the locations producing said minimum value.

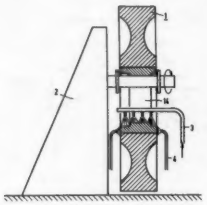
4,879,793

METHOD OF MANUFACTURING TURBINE WHEEL DISKS WITH LOCALLY HIGH INTERNAL COMPRESSIVE STRAINS IN THE HUB BORE

Erwin Stuecker, Essen-Frintrop, and Gerhard Roettger, Muelheim/Ruhr, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,670
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708507
Int. Cl.[4] B23P *15/04*
U.S. Cl. 29—156.8 R **4 Claims**

1. Method for manufacturing rotatable parts of rotary machines having a hub bore in a hub region with a central axis, which comprises pre-turning a contour at the hub region having a shape as seen in the direction of the central axis differing from the shape of a hub contour to be produced, performing the step of pre-turning the contour by forming regions of the pre-turned contour being oversized by a given amount as compared to the hub contour to be produced, and by forming at least one additional ring being oversized as compared to the hub contour to be produced by an amount greater than the given amount, heat-treating at least the hub region of a rotatable part, cooling at least the hub region having the pre-turned contour with a coolant fluid after the heat-treatment to produce internal compressive strains in the hub region, and reducing the pre-turned contour after the cooling to the hub contour to be produced.

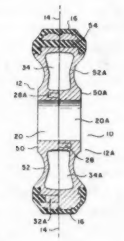


4,879,794

METHOD OF MAKING SHOCK ABSORBING WHEELS

Tobin Djerf, Port Isabel, Tex., assignor to Unarco Industries, Inc., Chicago, Ill.

Division of Ser. No. 137,978, Dec. 28, 1987, Pat. No. 4,818,034.
This application Jan. 3, 1989, Ser. No. 272,945
Int. Cl.[4] B21K *1/38*
U.S. Cl. 29—159.1 **19 Claims**



1. A method of making a shock absorbing wheel, comprising the steps of

forming a pair of identical disk-like hub sections each penetrated by a central aperture having an axis perpendicular to the plane of such hub section, and penetrated by a plurality of interlock apertures symmetrically disposed around the periphery of such hub section;

then mating said pair of identical disk-like hub sections, without forming a rigid interconnection therebetween, with said central aperture of each such hub section in coaxial alignment with said central aperture of the other of such hub sections and with each of said interlock apertures of each such hub section in alignment with one of said interlock apertures of the other of such hub sections so that each pair of aligned interlock apertures forms a continuous passageway through such mated pair of said identical disk-like hub sections; and

then forming a solid unitary tire of resilient material about the periphery of said mated pair of identical disk-like hub sections such that said tire extends symmetrically over the

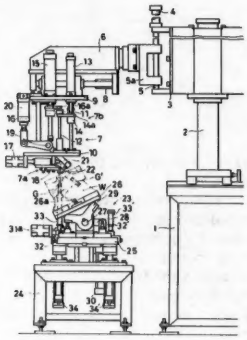
non-mated surface of each of such hub sections toward the center thereof a sufficient distance to overlie each of said plurality of interlock apertures and extends through the passageway formed by each pair of aligned interlock apertures to form a plurality of interlocking strands of tire material to simultaneously resiliently interconnect said pair of identical disk-like hub sections to each other and resiliently interconnect said solid unitary tire to said pair of identical disk-like hub sections.

4,879,795

VALVE INSERTING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Katsumi Nakamura; Norio Honda; Kazufumi Tamura, all of Suzuka, and Akifumi Kobayashi, Yokkaichi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Dainichi Kogyo Kabushiki Kaisha, Yokkaichi, both of, Japan

Filed Jan. 22, 1988, Ser. No. 146,949
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—214 **4 Claims**



1. A valve inserting apparatus for inserting an intake valve into an intake valve guide on an intake side of an internal combustion engine and an exhaust valve into an exhaust valve guide on an exhaust side of the internal combustion engine, both valve guides being attached to a cylinder head of the internal combustion engine in such a manner that longitudinal axial lines of both valve guides may cross each other obliquely, said valve inserting apparatus comprising:

a pair of valve supply means, one of the pair located at a first position for supply the intake valve, a head portion of the intake valve facing in an upward direction, and the other of the pair located at a second position for supplying the exhaust valve, a head portion of the exhaust valve also facing in an upward direction;

a jig means for locating the cylinder head relative to the valve supply means, located at a third position, having a jig plate which can hold the cylinder head set thereon in such a manner that a cylinder head surface toward a combustion chamber may be facing in an upward direction; and

a valve inserting means for selecting either an intake or exhaust valve from one of said pair of valve supply means and for inserting said selected intake or exhaust valve in the cylinder head, said valve inserting means being movable between the first and the third positions and between the second and the third positions and comprising a holding means, for detachably holding said selected valve, and a valve push-in means for pushing said selected valve into place on the cylinder head;

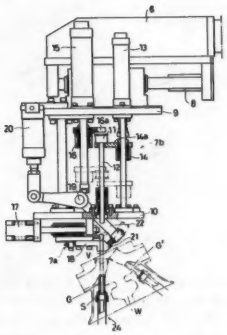
wherein said jig means includes a jig base on which the jig plate is pivotally supported to be swingable on a horizontal shaft for swinging from a horizontal position to one swung position at which an axial line of the intake valve guide extends vertically toward the valve inserting means and to another swung position at which an axial line of the exhaust valve guide extends vertically toward the valve inserting means, so that said valve inserting means can insert into the intake valve guide an intake valve supplied from said one of the pair of valve supply means when the jig plate is swung to said one swung position and said valve inserting means can insert into the exhaust valve guide an exhaust valve supplied from said other of the pair of valve supply means when the jig plate is swung to said another swung position.

4,879,796

VALVE INSERTING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Katsumi Nakamura; Shigeyuki Koide; Norio Honda; Kazufumi Tamura, all of Suzuka, and Akifumi Kobayashi, Yokkaichi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Dainichi Kogyo Kabushiki Kaisha, Yokkaichi, both of, Japan

Filed Jan. 22, 1988, Ser. No. 146,948
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—214 **7 Claims**



1. A valve inserting apparatus for an internal combustion engine, a cylinder head of the engine being supported by a jig means such that a surface of said cylinder head on a combustion chamber side is positioned facing upward, such that a longitudinal axis of a valve guide which is assembled to the cylinder head is kept vertical while a valve is inserted into the valve guide from thereabove by said valve inserting apparatus, said valve inserting apparatus comprising:

a valve inserting means, located above said cylinder head for movement relative to the cylinder head, said valve inserting means including a valve holding means for detachably, swingably, holding the valve with a head portion of said valve facing upward and said valve inserting means further including a valve push means for pushing in said valve into said valve guide; and

a suction means for moving into contact with a lower end of the valve guide of the cylinder head to supply suction thereto, while said valve is being located therein said suction means being supported on said jig means and being located beneath said cylinder head and coaxial with the longitudinal axis of the valve guide, wherein said valve push-in means comprises an upwardly and downwardly movable push rod having a weight attached to an upper end portion of said push rod, and wherein said valve inserting means includes a first detecting means for detecting whether or not the push rod is at a first predetermined reference position, said first predetermined reference position being a position of said push rod when the rod is

in abutment with the valve and whereby when said push rod is in said first predetermined reference position said valve inserting means is lowered to where a lower end of the valve has been inserted into an upper end of the valve guide to a predetermined depth.

4,879,797

AN ASSEMBLING JIG FOR ASSEMBLING A FLY WHEEL AND AN IGNITION COIL TO AN ENGINE

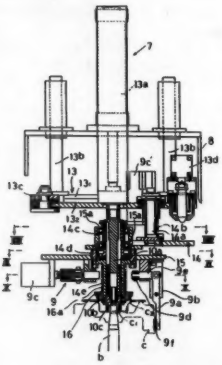
Teruo Yoshioka; Shoji Nakano, and Yutaka Sato, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,781

Claims priority, application Japan, Jul. 21, 1986, 61-169777; Jul. 21, 1986, 61-169778

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—240 1 Claim



1. An assembling jig used for a process in which a fly wheel is assembled to an end portion of a crankshaft of an engine and an ignition coil is assembled to an engine main body to face a circumferential surface of said fly wheel, said assembling jig comprising:

a spring;

a moving mechanism provided with a driving plate which is movable to advance and to retreat in an axial direction of said crankshaft, said driving plate being provided with a first fastening means for fastening said fly wheel to said crankshaft;

a jig frame attached to said showing mechanism;

an urging plate which is movable to retreat against an action of said spring along the axial direction thereof, and in such a direction that said urging plate moves away from said crankshaft, said urging plate being supported by said driving plate;

a rotary plate which is turnable about said axis, said rotary plate being attached to said urging plate, and said rotary plate being provided with a first holding means for holding said fly wheel;

a movable frame which is movable to advance and to retreat in a radial direction about said axis, said movable frame being attached to said driving plate, said movable frame being provided with a second holding means for holding said ignition coil, and said movable frame being provided with a second fastening means for fastening said ignition coil to an engine main body; and

a shim provided on either one of said urging plate and said movable frame, said shim being movable to advance toward and to retreat from a space left between said ignition coil and said fly wheel.

4,879,798

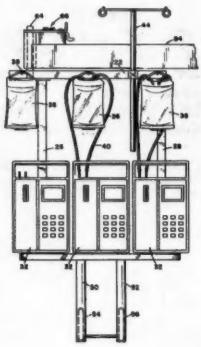
METHOD FOR PATIENT EQUIPMENT TRANSPORT AND SUPPORT SYSTEM

John H. Petre, Cleveland Heights, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Division of Ser. No. 886,207, Jul. 15, 1986, Pat. No. 4,795,122. This application Sep. 29, 1988, Ser. No. 251,189

Int. Cl.[4] B23P *11/00, 19/04*

U.S. Cl. 29—434 3 Claims



1. A method for support and transport of hospital patient care items comprising:

providing a transport bracket sized for support of a plurality of the hospital patient care items, said bracket including a mating means for selective attachment to a hospital bed and a service column,

selectively attaching the transport bracket to a hospital bed at a time when the patient care items are to be transported on said bracket attached with the bed which carries a patient; and,

selectively attaching the transport bracket to the service column at a place of patient care and thereafter unattaching the transport bracket from the bed at a time when the patient care items are to be supported on said bracket locating near the patient.

4,879,799

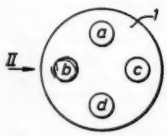
HEAT-RECOVERABLE ARTICLE

Richard C. Sovish, Waterloo; Frank K. A. Selleslags, Haasrode, and Marc F. L. Moisson, Strombeek Bever, all of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 71,535, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 845,658, Mar. 28, 1986, abandoned, which is a division of Ser. No. 79,335, Sep. 22, 1979, Pat. No. 4,579,148, which is a continuation of Ser. No. 846,322, Oct. 28, 1977, abandoned. This application Mar. 4, 1988, Ser. No. 168,594

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—447 4 Claims



1. A method of differentially recovering heat-recoverable conduits, which comprises:

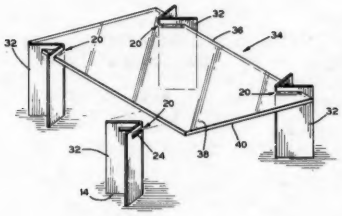
(1) providing an article comprising a plurality of heat-recoverable conduits whose mutual proximity is such that heat required to recover one conduit might otherwise cause at least partial recovery of a proximate conduit;
(2) inserting a plug member into said proximate conduit thereby blocking said proximate conduit, said plug member comprising:
(a) a first hollow part which lies inside a length of said proximate conduit in contact with a wall thereof, and
(b) a second part attached to the first part so that the second part can at least be partially detached so as to leave the conduit open with the hollow first part still in position inside the conduit but removable so that recovery of said proximate conduit can be effected, said first hollow part in combination with said second part capable of blocking said proximate conduit; and
(3) heating said one conduit while said proximate conduit remains blocked.

4,879,800

METHOD OF PRODUCING A COLUMNAR SUPPORT STRUCTURE

Sally H. Rumman, P.O. Box 39, Sylvania, Ohio 43560

Filed Jul. 29, 1988, Ser. No. 225,896
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 **1 Claim**



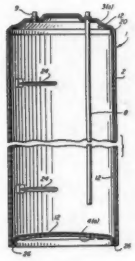
1. A method of producing an article of furniture having at least one columnar support structure comprising the steps of:
(a) providing a top having generally parallel upper and lower planar surfaces and a predetermined thickness;
(b) providing a blank of planar sheet material having a first upper edge and a second lower edge joined by opposed side edges;
(c) forming at least one rectangular opening in said blank, said opening including opposed first and second sides disposed parallel to the lower edge, and spaced apart a predetermined distance slightly greater than the thickness of said top;
(d) providing an axis on said blank intersecting said opening and normal to the second lower edge, the axis dividing said blank into first and second portions;
(e) bending said blank about said axis effecting relative displacement of the first and second portions and said opening therein thereby producing a support structure having a convex side and a concave side;
(f) providing said upper and lower sides of said opening with elastomeric pads; and
(g) assembling the columnar support structure on one edge of said top whereby the top is inserted into yieldably gripping engagement with said pads in the rectangular opening in the convex side of the support structure and supported on the second side thereof.

4,879,801

CATHODICALLY PROTECTED WATER HEATER

James S. Stubbe, Milwaukee; James L. Chevalier, Mequon, and Edwin C. Pow, Menomonee Falls, all of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Division of Ser. No. 200,468, May 31, 1988, Pat. No. 4,838,208, which is a division of Ser. No. 131,576, Dec. 11, 1987, Pat. No. 4,783,896, which is a continuation-in-part of Ser. No. 940,430, Dec. 11, 1986, abandoned. This application Apr. 26, 1989, Ser. No. 343,957
Int. Cl.[4] B21D *53/00*; B23P *15/26*; B21K *29/00*
U.S. Cl. 29—455.1 **4 Claims**



1. A method of fabricating a water heater vessel for containing and heating water, comprising the steps of providing a steel head having a central section and an annular flange extending longitudinally from said central section, said flange terminating un a lower annular edge, said head having an inner surface to be exposed to the water, providing a steel generally cylindrical shell having an inner annular surface, applying a layer of a material resistant to corrosion by water to said inner surface of said shell, thermally spraying a coating of a metal anodic to steel on the inner surface of said head and on said flange and extending said coating substantially to said lower edge, positioning said head within the end portion of said shell with the lower edge of said flange projecting downwardly at least to the end of said shell with said surfaces disposed in lapping relation, and joining said end portion of said shell to said flange by a weld extending directly through said anodic metal coating whereby said metal coating on said head flange flows about said weld and contacts said material on said shell to hydraulically seal off said weld from contained water and provide a corrosion barrier and anodic surface to contained water at the location of said weld.

4,879,802

GRIPPER FOR TOOLS OF A MACHINE TOOL

Winkler, Hans-Henning, Tuttlingen, and Eugen Rüschle, Mühlheim, both of Fed. Rep. of Germany, assignors to Chiron-Werke GmbH & Co. KG, Tuttlingen, Fed. Rep. of Germany

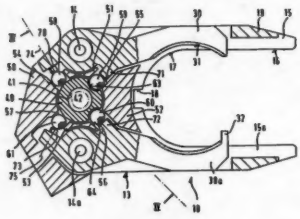
Filed May 10, 1988, Ser. No. 192,188
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717201
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **4 Claims**

1. A machine tool comprising:
(a) a working spindle;
(b) a stationary stopper element;
(c) a tool holder magazine; and
(c) transfer means for transferring tool holders between said tool holder magazine and said working spindle, said transfer means having a movable gripper for gripping said tool holders and having
a hand with two jaws being each arranged pivotally about an axis and being each provided with two cams, respectively, for pivoting said jaws into a first operating position with

said jaws closed for gripping one of said tool holders in a form-locking relationship or into a second operating position, respectively, with said jaws spread apart for introducing one of said tool holders between said jaws or for removing said tool holder therefrom, respectively,

an axially displaceable, spring-loaded bolt being provided with four guiding surfaces extending at an angle relative to a longitudinal bolt axis, said guiding surfaces being distributed over a bolt periphery in oppositely directed pairs,

four bolts being arranged one each between one of said guiding surfaces and one each of said cams to pivote said



jaws between said first operating position with said spring released and said second operating position with said spring compressed by alternately urging a first and a second of said bolts against a first and a second of said cams on one each of said jaws by means of a first and a second of said guiding surfaces or urging a third and a fourth of said bolts against a third and a fourth of said cams on one each of said jaws by means of a third and a fourth of said guiding surfaces, and

displacement means for displacing said movable gripper to bring said spring-loaded bolt into mechanical contact with said stationary stopper element thereby axially displacing said bolt.

4,879,803

METHOD FOR MOUNTING A PLURALITY OF BRUSHES

Norio Semura, Aichi; Masumi Tsuchida, Toyokawa, and Yoshihiro Shimamura, Kosai, all of Japan, assignors to ASMO Co., Ltd., Kosai, Japan

Filed Jul. 29, 1988, Ser. No. 226,055

Claims priority, application Japan, Aug. 14, 1987, 62-201929; Oct. 29, 1987, 62-165740

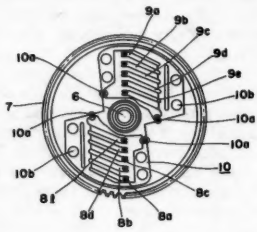
Int. Cl.[4] H02K *15/02*

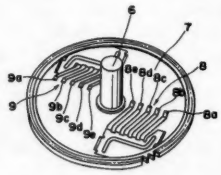
U.S. Cl. 29—598 **5 Claims**

1. A method for mounting a plurality of brushes in a mechanism for detecting a rotational position of an actuator, said mechanism including a base body adapted to be affixed to a motor driven output shaft of the actuator, each of said brushes including a group of comb-shaped slide terminals, said brushes mounted on said base body in generally symmetrically relationship such that said slide terminals are adapted to slide on switching patterns and cause the motor to stop upon said slide terminals reaching edges of the switching patterns, said method comprising the steps of:

providing said slide terminals on a common plate having narrow portions interconnecting sections of said plate containing respective groups of said slide terminals,

mounting said plate fixedly on a surface of said base body in a preselected position, and





severing said narrow portions of said plate to separate said plate sections from one another.

4,879,804

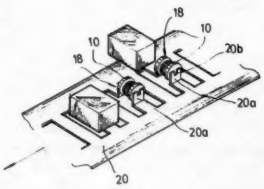
METHOD OF FABRICATING A COIL

C. Y. Chiang, No. 238-6, Shian Chuang Tze Yeong An, Hsin Wu, 32707 Tao Yuan, Taiwan

Filed Sep. 30, 1988, Ser. No. 252,069

Int. Cl.[4] H01F *41/00*

U.S. Cl. 29—605 **1 Claim**



1. A method of fabricating a coil comprising the steps of:

forming a frame having a pair of opposingly displaced vertically disposed supporting legs each of said supporting legs having a notch formed within an upper portion thereof;

mounting an axial coil, said axial coil having a ferrite core and an electrically conducting wire extending along a center line of the ferrite core, said electrically conducting wire extending from opposing axial ends of said ferrite core between said supporting legs by placing said wire in said notches;

severing opposing ends of said conducting wire extending beyond said notches;

joining the conducting wire to said axial ends of the ferrite core;

encapsulating the combined supporting legs and the axial coil with resin thereby forming an enclosed structure; and,

bending a lower part of each supporting leg upwardly along a respective outer surface of said structure thereby forming electrodes at the respective ends of the coil.

4,879,805

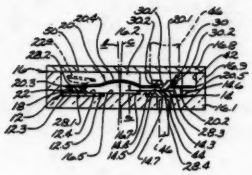
METHOD FOR MAKING A CIRCUIT INTERRUPTER DEVICE

Donald Tomkinson, North Attleboro, and John R. D'Entremont, Foxboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 44,866, Apr. 30, 1987, Pat. No. 4,780,698. This application Aug. 18, 1988, Ser. No. 233,392

Int. Cl.[4] H01H *11/06*

U.S. Cl. 29—622 5 Claims



1. A method for making a circuit interrupter device comprising the steps of blanking a pair of terminals from a flat metal strip in selected spaced relation to each other and blanking carrier portions of the strip connected to the terminals for temporarily maintaining the terminals in said spaced relation, molding an electrically insulating housing around the terminals including a first housing side having selected portions of the terminals embedded therein so that respective side surfaces of the embedded terminal portions are exposed from the housing material at said one housing side and including a second housing side adjacent said one housing side having ends of the respective terminals extending through said second housing side, securing first contact means to the exposed side surface of the embedded portion of one of the terminals, securing a thermostat metal element having movable contact means thereon to the exposed side surface of the embedded portion of the other of said terminals so that the thermostat metal element extends closely along said one housing side for moving the movable contact means into and out of engagement with the first contact means in response to occurrence of selected thermostat element temperatures, and blanking the carrier portions of the flat metal strip from the terminals to leave the terminals supported in the housing material molded thereon.

5. A method for making a condition responsive device comprising the steps of providing a pair of elements in spaced relation on a base, securing first contact means to one of the base elements, providing a thermostat metal element having movable contact means at one end and having a relatively long and narrow projection weld means thereon adjacent an opposite end thereof, engaging said projection weld means with the other base element with the projection weld means extending along a line of engagement with the other base element and rotating the thermostat metal element around that line of engagement for engaging the movable contact means with the first contact means with selected contact force, and resistance welding the thermostat metal element to the other base element along said line of engagement for securing the thermostat element to that other element to move the movable contact means into and out of engagement with the first contact means in response to occurrence of selected thermostat element temperatures.

4,879,806

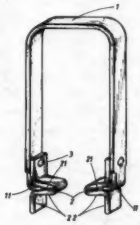
TOOL FOR DIP-TYPE ICS

Yee C. Feng, 5F-1, No. 189, Chang An E. Rd., Sec. 2, Taipei, Taiwan

Filed Aug. 3, 1988, Ser. No. 227,876

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—741 9 Claims



1. A tool for a DIP-type IC comprising:

an inverted U-shaped body having two elastic parallel arms respectively having two free ends and means for inserting said IC on a PCB and for removing said IC from said PCB,

said means including a lip on each of said free ends for removing said IC and an end piece rotatably fastened to each arm, each end piece having a surface for inserting said IC and a recess for covering said lip during said inserting, whereby said end piece is rotated away from said lip during said removing and is rotated to cover said lip during said inserting.

4,879,807

METHOD OF MAKING A SEALED COAXIAL CABLE SPLICE

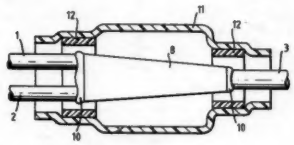
Philippe Roucaute, Chambly, France, assignor to Raychem Pontoise S.A., France

Filed Jun. 2, 1988, Ser. No. 201,704

Claims priority, application United Kingdom, Jun. 8, 1987, 8713369

Int. Cl.[4] H01B *13/20*

U.S. Cl. 29—828 12 Claims



1. A method of forming a sealed electrical connection to a coaxial cable which comprises a central conductor, a cable shield separated from the central conductor by a dielectric, and a cable jacket located over the shield, which method comprises:

(a) forming an electrical connection between the central conductor of the coaxial cable and another conductor;

(b) positioning a first heat-shrinkable sleeve so that it extends over the coaxial cable and the other conductor with one end positioned around the coaxial cable, and positioning a quantity of thermoplastic sealing material over the jacket of the coaxial cable so that part of the quantity of thermoplastic sealing material extends beyond said end of the sleeve the heat-shrinkable sleeve containing a shield por-

tion for connecting the shield of the coaxial cable to another shielding element;

(c) heating the heat-shrinkable sleeve to form an insulated electrical connection in which the shield portion of the heat-shrinkable sleeve is electrically connected to the shield of the coaxial cable and part of the quantity of thermoplastic sealing material extends beyond said end of the recovered heat-shrinkable sleeve; and

(d) positioning an outer element of a thermoplastic sealing material about said end of the first sleeve and recovering a second heat-shrinkable sleeve over said first sleeve and said outer element so that said outer element is enclosed within the second heat-shrinkable sleeve and fuses with the thermoplastic sealing material so that the thermoplastic sealing material and the thermoplastic element together form a barrier against ingress of moisture to the electrical connection

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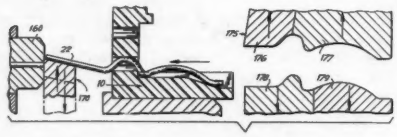
4,879,808

METHOD FOR MAKING PLASTIC LEADED CHIP CARRIER

Donald A. Smith; William H. Carter, both of Union City; Howard E. Dingfelder, Corry; Dale L. Burgess, Union City, and Alan B. Gates, Corry, all of Pa., assignors to Barnes Group Inc., Bristol, Conn.

Filed Aug. 10, 1988, Ser. No. 230,810
Int. Cl.[4] H01R *9/16*
U.S. Cl. 29—845 **27 Claims**



1. A method for making a plastic leaded chip carrier comprising the steps of:

aligning a base having a plurality of apertures with a wire feed device;

advancing one end of a wire from said wire feed device from one side of said base and through a first aperture therein such that said wire end extends from said base;

forming a predetermined configuration of the wire at said end which has passed through the first aperture of said base;

retracting said formed wire end into said aperture so that said predetermined configuration lockingly engages said wire end with said aperture; and

cutting said wire so that said wire end forms a pin locked in said first aperture for conducting electrical information through said base.

4,879,809

METHOD AND APPARATUS FOR TERMINATING RIBBON CABLES

Vincent Nicholas, Spring Hill, and Paul P. Siwinski, Seminole, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1988, Ser. No. 168,350
Int. Cl.[4] H01R *43/02*; B23P *19/00*
U.S. Cl. 29—860 **19 Claims**

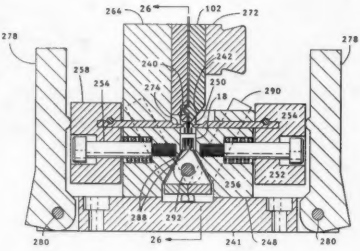
1. A method of handling a ribbon cable formed of electrical conductors in a web of electrical insulation in association with the attaching thereof with a connector, comprising the steps of:

(a) releasably coupling a guide member to the cable at a predetermined location with respect to the end of the cable;

(b) moving the guide member and coupled cable end through a series of processing stations whereat the guide member functions to accurately locate the cable end with respect to the operating mechanisms at the processing stations, such processing stations being operative for the attaching of the cable end with a connector; and

(c) removing the guide member from the cable.

17. Apparatus for handling a ribbon cable formed of electrical conductors in a web of electrical insulation during the attaching thereof to a connector, comprising a guide member releasably coupleable with the cable a[+] a predetermined loca-



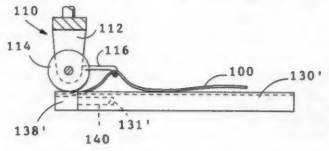
tion with respect to the end of the cable; and means to sequentially couple the guide member and cable end in operative relationship with a series of processing stations whereat the guide member functions to accurately locate the cable end with respect to the operating mechanisms of the processing stations, such processing stations being operative for the attaching of the cable end to a connector.

4,879,810

METHOD FOR ELECTRICAL WIRING UTILIZING WIRE RETAINER

Ronald G. Sergeant, Miami, Fla., and Allen F. VanDerStuyf, Kernersville, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1987, Ser. No. 134,325
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—861 **10 Claims**



1. In a method of forming electrical wiring harnesses intended to interconnect components incorporated into structural units of apparatus, the steps comprising:

a. providing a first element forming a structural part of an apparatus served by the harness to be formed with grooves extending in a surface of said element in a pattern to form such harness,

b. providing a second element including wire retention means, said second element having grooves aligned with the grooves of the first element,

c. providing wires of sufficient lengths to fill the said grooves of said elements,

d. inserting a segment of each wire into a groove of said second element,

e. inserting the second element in an abutting engagement with the said first element whereby the said grooves are aligned,

f. bringing wire driving means to bear against the surface of said second element, and

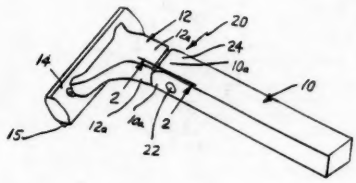
g. causing relative movement between said wire driving means and said first and second elements to implant the wires in the grooves of said first element.

4,879,811

SAFETY RAZOR

Daniel J. Cooney, 31360 Old Cannon Rd., Birmingham, Mich. 48010

Filed Oct. 1, 1987, Ser. No. 103,836
Int. Cl.[4] B26B *21/14*
U.S. Cl. 30—89 **10 Claims**



1. A safety razor comprising:

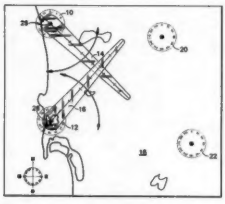
a first elongate handle, a second elongate handle having a blade-carrying head adjacent an end thereof and hingedly connected adjacent another end to the first handle to establish a hinge joint between the handles, said handles being configured to nest one inside the other adjacent the hinge joint with the outer of said nested handles having spaced apart side walls and an intermediate wall between the side walls forming an elongate recess for receiving the inner of said handles adjacent said hinge joint, and means for biasing the second handle adjacent the hinge joint toward the skin of the person shaving, said biasing means being disposed in said recess.

4,879,812

AERIAL MAP NAVIGATIONAL AID

Randolph W. Rabb, 7910 Pat St., La Mesa, Calif. 92042

Filed Aug. 31, 1988, Ser. No. 238,902
Int. Cl.[4] B43I *7/00*
U.S. Cl. 33—1 MP **12 Claims**



1. A system for determining a position of a craft on a map based on a pair of compass direction readings from a receiver tuned to receive signals from a pair of spaced apart transmitting stations whose locations are indicated on the map, comprising:

a pair of elongate arms;

a pair of releasably connectable and rotatable attachment mechanisms, each having a first part secured to an inner end of a corresponding one of the arms and a second part with a quantity of adhesive on an underside thereof for attachment to the map;

a pair of friction bearing means for each permitting a corresponding one of the arms to be manually rotated relative to the second part of its corresponding attachment mechanism while also maintaining a fixed rotational position of the one arm when it is manually released; and

a pair of compass rose disks each having a quantity of an adhesive on an underside thereof for attachment to the map over a pre-printed compass rose marking on the map surrounding the location of one of the transmitting stations and for having the second part of a corresponding attachment mechanism adhered to the center thereof;

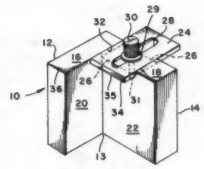
whereby the arms may be rotated to positions corresponding the compass direction readings and a position on the map adjacent the crossing of a pair of outer ends of the arms will represent the position of the craft on the map.

4,879,813

APPARATUS FOR INSPECTING TWIST DRILLS

Jeffrey T. Silva, 4616 Exeter St., Annandale, Va. 22003

Filed Apr. 8, 1988, Ser. No. 179,317
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—201 **6 Claims**



1. An apparatus for determining the concentricity of the chisel ridge and the symmetry of the outer corners of the said apparatus, cutting edges of the point of a twist drill comprising an upstanding V-shaped blocked defining first and second legs having flat inner surfaces positioned at a right angle to one another, said legs having flat upper and lower surfaces which parallel one another and which are at a right angle to said inner surfaces, said upper services lying in a common plane, a reference plate having a forward end and a length which is longer than the width of said second leg, the upper surface of said second leg being formed with a channel paralleling said first leg to slidably receive said reference plate, said reference plate having a longitudinally extending slot therein, and threaded means connected to said channel and received in said longitudinally extending slot to releasably fix said reference plate in said channel, and the forward end of said reference plate terminating in a wedge having a tip which parallels the inner surface of said second leg.

4,879,814

METHOD AND APPARATUS FOR BORESIGHT ALIGNMENT OF ARMORED BATTLEFIELD WEAPONS

Barry M. Wallace, and Ross Fasolino, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 28, 1987, Ser. No. 92,020
Int. Cl.[4] G01B *11/26*
U.S. Cl. 33—234 **7 Claims**

1. A method of aligning a gun comprising the steps of:

(a) providing a boresight device in a shell casing having an aligned laser therein, said laser being aligned by

(1) providing an optically flat mirror;

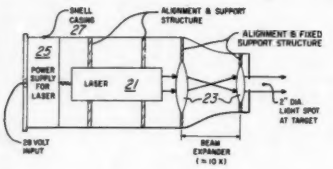
(2) aligning an alignment laser so that the light beam emanating therefrom is normal to the flat surface of said mirror;

(3) providing an alignment tool having a mirrored surface and securing said boresight device so that the axis of said device is normal to said mirrored surface;

(4) adjusting said mirrored surface to be normal to the light beam emanating from said alignment laser, and

(5) adjusting the aligned laser so that a light beam emanating therefrom is normal to the flat surface of said optically flat mirror;

(b) placing the shell in the breech of a gun to be aligned;



(c) projecting a beam of light from the aligned laser toward a target; and

(d) adjusting the gun to project the beam onto the target.

4,879,815

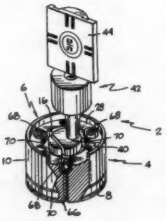
ALIGNMENT APPARATUS

Peter Vischer, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Oct. 13, 1988, Ser. No. 256,984

Int. Cl.[4] G01C *15/00*

U.S. Cl. 33—293 **16 Claims**



1. Apparatus for use in an optical alignment system comprising:

a housing adapted to be permanently mounted in a fixed support surface for providing a level base support;

said housing having an open top end and a closed bottom end and a central longitudinal axis;

said housing having at least a first bore having a generally cylindrical inner surface and a longitudinal axis coinciding with said central longitudinal axis of said housing means;

said closed bottom end having an inner surface facing said at least a first bore, said inner surface being substantially planar;

target means for providing an optical target to be properly positioned along a centerline;

plug means for providing a support for said target means, said plug means being rotatably mounted in said at least a first bore;

said plug means having at least one generally cylindrical outer surface having a longitudinal axis and a diameter slightly smaller than the diameter of said generally cylindrical inner surface of said at least a first bore so that said plug means are snugly received in said at least a first bore and said longitudinal axis of said plug means coincides with said longitudinal axis of said at least a first bore;

said plug means having a substantially planar bottom surface extending parallel to said inner surface of said bottom end for mating engagement therewith;

an eccentric bore extending through said plug means and having a longitudinal axis spaced from and parallel to said longitudinal axis of said at least one bore; and

said target means having a support stem for mating engagement in said eccentric bore for positioning and supporting said optical target so that rotation of said plug means moves said optical target in lateral directions.

4,879,816

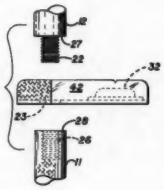
COMBINATION RANGE POLE AND BUBBLE-LEVEL THEREFOR

Anthony H. Sierk, 904 Palm Trail, Delray Beach, Fla. 33483

Filed Oct. 24, 1988, Ser. No. 261,095

Int. Cl.[4] G01C *15/06*

U.S. Cl. 33—295 **8 Claims**



1. A combination of a sectionalized range pole and bubble-level indicating device therefor comprising:

(A) a plurality of pole sections, each of said sections comprising two flat end surfaces normal to the length thereof, a threaded extension central to one of said surfaces and a matching threaded opening central to the other of said surfaces,

(B) a bubble-level supporting member comprising opposing parallel flat faces, said member comprising a wall defining a hole through said faces, said extension passing through said hole and said faces pressing upon said surfaces when said sections are connected said bubble-level supporting member being precisely normal to said pole sections, and

(C) a bubble-level mounted on said supporting member.

4,879,817

CHECKING THE SETTING OF A TOOL

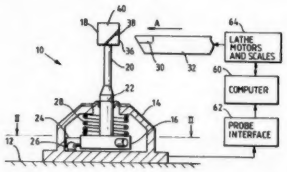
David R. McMurtry, Wotton-under-Edge, United Kingdom, assignor to Renishaw plc, England

Filed Nov. 3, 1987, Ser. No. 116,142

Claims priority, application United Kingdom, Nov. 15, 1986, 8627374

Int. Cl.[4] G01B *21/04*

U.S. Cl. 33—502 **16 Claims**



1. A stylus tip for a tool-setting probe for a machine tool, configured relative to a set of first, second and third orthogonal axes and having:

means for attachment of the tip to the tool-setting probe;

a first datum surface located on the tip normal to said first axis and accessible by movement of a tool along a first line parallel to said first axis; and

a second datum surface located on the tip lateral of said first datum surface in a direction of said second axis, and accessible by movement of said tool along a second line parallel

to said first axis, said first and second lines being spaced apart in said direction of said second axis;

wherein said second datum surface extends at a non-90° angle with respect to said first datum surface and said third orthogonal axis.

4,879,818

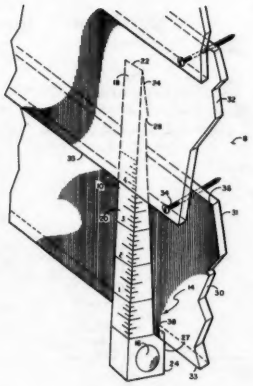
CLAPBOARD SLIDE GAUGE

Nicholas J. Beaulieu, 2 Spruce St., Gardiner, Me. 04345

Filed Jan. 26, 1989, Ser. No. 301,891

Int. Cl.[4] G01B *3/30*

U.S. Cl. 33—646 **1 Claim**



1. A device for installation of a lower clapboard under the next adjacent upper clapboard, comprising:

a body member having a base, an upper tip portion and a top extending at an angle to said base forming a wedge shape for insertion under said upper clapboard;

a clapboard receipt notch having an upper and lower portion defined in said base adapted to receive a clapboard, said clapboard receipt notch having a notch base at its lower portion;

a measurement scale on said device with its 0 point aligned with said notch base; and

a clapboard slide arc defined in the upper portion of said clapboard receipt notch to allow easy removal of said device when said lower clapboard is tacked in place by the clapboard slide arc sliding over the top front edge of said lower clapboard being installed when the device is withdrawn after positioning said lower clapboard under said upper clapboard a distance corresponding to a desired measurement on said scale aligned with the base of said upper clapboard.

4,879,819

GAUGE FOR COUPLING COMPONENT

Lonnie E. Johnston, Bedford, and Steven J. Volcansek, Garfield Heights, both of Ohio, assignors to Crawford Fitting Company, Solon, Ohio

Filed Oct. 5, 1988, Ser. No. 253,962

Int. Cl.[4] G01B *5/14*

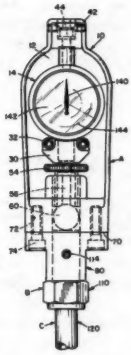
U.S. Cl. 33—833 **26 Claims**

1. A gauge assembly for fittings of the type including a coupling nut having a threaded internal opening and adapted to encircle a cylindrical member and a ferrule positioned on the cylindrical member, the gauge being used for determining the pull up of the ferrule and the deformation or swaging that the cylindrical member has undergone, the gauge assembly comprising:

an indicating unit having a readout means for showing whether the swaging of the cylindrical member is within tolerances; and,

a piston movably mounted in said indicating unit and operatively connected to said readout means, said piston comprising:

a body having a bore,



an external thread means on said body circumferentially of said bore for threadedly engaging the threaded internal opening of the coupling nut carried on the cylindrical member, and

a means within said bore for aligning the cylindrical member with said bore and limiting the extent of movement of the cylindrical member into said bore.

4,879,820

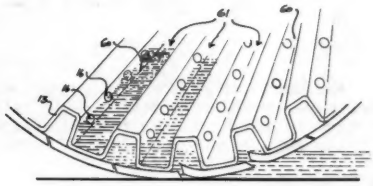
APPARATUS FOR REMOVING WATER FROM THE GROUND

Hugh R. McLaughlin, Dublin, Ireland, assignor to Zestful Holdings Limited, Douglas, Isle of Man

Filed Aug. 3, 1988, Ser. No. 227,574

Int. Cl.[4] E01H *1/00*

U.S. Cl. 34—71 **10 Claims**



1. An apparatus for removing water from the ground, comprising at least one ground-engaging drum including a hollow cylinder mounted for rotation about a substantially horizontal axis, a plurality of recesses substantially parallel to the rotational axis of the cylinder formed in the outer surface of the cylinder around the periphery thereof, a non-porous sheet of resilient material covering the outer surface of the cylinder, a plurality of slits in the covering sheet over the recesses in the cylinder, such slits normally being closed but being capable of opening under the pressure of water built up in front of the drum, as the latter is moved across the ground, to permit such water to enter the recesses in the region of ground contact, the slits closing away from the region of ground contact to retain the water in the recesses, and apertures in the recesses to permit water retained therein to discharge into the interior of the

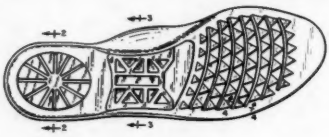
cylinder at a certain height within the cylinder, the apparatus further including means within the cylinder for collecting water discharged from the recesses.

4,879,821

INSOLE CONSTRUCTION

Kenneth Graham, Wakefield, Mass.; Kenton D. Geer, Exeter, N.H., and Katherine Bednarski, Amesbury, Mass., assignors to Hyde Athletic Industries Inc., Peabody, Mass.

Filed Sep. 4, 1987, Ser. No. 94,483
Int. Cl.[4] A43B *13/38, 13/40, 21/32*
U.S. Cl. 36—44 **10 Claims**



1. An insole construction for a walking shoe and the like comprising

an insole layer of resilient compressible material having a forward portion for supporting the ball of the foot and toes of a wearer, an instep portion for supporting the instep of the foot and a heel portion for supporting the heel of the wearer; said heel portion having upwardly flared peripheral walls defining a heel cup and said instep portion having upwardly flared peripheral walls defining a flexible support for a wearer's instep and with the peripheral walls of the instep portion projecting outwardly more on the medial than the lateral side of said insole construction;

an insert having a greater stiffness and less compressibility than said insole layer positioned below and secured to said insole layer and having an instep section and a heel section, said instep section having a width that is at least ½ but less than the width of said instep portion whereby pronation by the wear may be controlled;

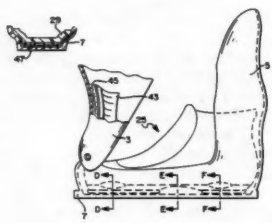
said heel section formed with an enlarged opening through which a segment of said heel portion projects, said heel section having an upwardly flared sidewall engaging the sidewall of said heel portion of the lower periphery thereof providing support for the lower of said flared walls.

4,879,822

SKI BOOT AND SPORT SHOE ASSEMBLY

Jaye B. Hayes, 691 Orchard Dr., N.W., Lancaster, Ohio 43130

Division of Ser. No. 869,279, Jun. 2, 1986, Pat. No. 4,747,221.
This application May 26, 1988, Ser. No. 198,988
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—119 **4 Claims**



1. A ski boot for use with a sport shoe, comprising:

a rigid footbed defining a floor surface, said footbed having a forward portion and a rear portion;

a front cuff portion connected to said forward portion of said footbed;

a rear cuff portion connected to said rear portion of said footbed; and

substantially rigid support means provided on said footbed for supporting and suspending said shoe within said boot above said footbed floor surface so as to define a chamber between said footbed floor surface and said shoe for receiving debris such as snow and ice, said support means comprising a first pair of laterally spaced contoured support surfaces located on opposite sides of said forward portion of said footbed and a second pair of laterally spaced contoured support surfaces located on opposite sides of said rear portion of said footbed.

4,879,823

DECORATIVE MESSAGE DISPLAY

Dane H. Collins, 5242 N. 24th St., Phoenix, Ariz. 85016

Filed Jun. 6, 1988, Ser. No. 202,325
Int. Cl.[4] G09F *1/00*
U.S. Cl. 40—124.1 **22 Claims**

1. A display apparatus, comprising:

a front panel having a message area and an image area;

a base for maintaining said front panel in an upright position;

a plurality of rods each having first and second ends;

a plurality of decorative means, each of said decorative means being an inflated balloon having a neck portion, each coupled to the first ends of one of said plurality of rods, the second end of each of said plurality of rods being inserted into said front panel; and

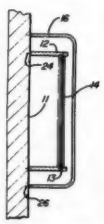
at least one clip for coupling said base to said front panel.

4,879,824

FLOATING PICTURE FRAME

Joanne Galloway, P.O. Box 520, Franklin, Mich. 48025

Filed May 31, 1988, Ser. No. 200,571
Int. Cl.[4] A47G *1/06*
U.S. Cl. 40—152.1 **6 Claims**



1. A picture frame assembly comprising:

a pair of horizontally disposed, opposed, parallel and spaced transparent brackets, each bracket having means forming a groove disposed along the length thereof proximate a first edge thereof;

a sandwich assembly formed by a backing, a picture, and a transparent front plate, all of approximately equal size, said grooves in the brackets being sized to receive and retain substantially all of the length of the top and bottom of said sandwich therein;

means for mounting a second edge of each of the brackets on a wall, said second edge disposed spaced from and parallel to said first edge such that the sandwich retained by the grooves is supported in spaced and parallel relation thereto, which is cooperation with the transparent brackets creates the visual illusion that the picture is floating in space;

a transparent cover adapted to enclose the edges and front face of the mounted, bracketed sandwich assembly and be spaced therefrom; and

means for mounting the cover on the wall.

4,879,825

CYCLIC REARRANGEMENT APPARATUS FOR STACKED RECTANGULAR SHEETS

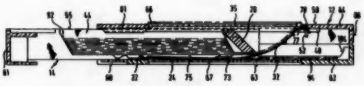
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Continuation of Ser. No. 897,763, Jul. 11, 1986, Pat. No. 4,759,142. This application Jul. 7, 1988, Ser. No. 216,153

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441488

Int. Cl.[4] G09F *11/30*

U.S. Cl. 40—513 **118 Claims**



1. Apparatus for cyclic rearrangement of a pile of substantially rectangular sheets of nominally identical thickness, said apparatus comprising a first frame part and a second frame part, said frame parts being and reciprocable relative to each other in a reciprocation direction between a closed position and an open position, the apparatus further including means for removal, upon each reciprocation of said frame parts, of an individual sheet at one end of said pile and for adding it again to the other end of said pile, said means including:

(a) separating means for separating said individual sheet from said pile, said separating means comprising:

(i) a separator element in said second frame part, said separator element having surface portions for engaging those borders of the sheets in said pile which are trailing upon start of said reciprocation from said closed position,

(ii) a support in said first frame part positioning said individual sheet relative to said separator element when said frame parts are in said closed position, said separator element having an end edge facing support in said closed position, and

(iii) spacing means cooperating with said separator element for defining a distance between said support and said end edge so as to form a passage gap for said individual sheet upon start of said reciprocation from said closed position, said distance being greater than the thickness of one sheet and less than the thickness of two sheets;

(b) feeding means for feeding sheets to said separating means;

(c) first retaining means for holding said individual sheet in said first frame part and second retaining means for holding the remainder of said pile in said second frame part; and

(d) guiding means for guiding the separated individual sheet for returning it to the other end of the remainder of the pile after having passed said passage gap.

4,879,826

ILLUMINATED CHARACTERS OF GRAPHIC SYMBOLS FOR EXTERNAL FIXING TO VEHICLES

Christian A. Wittke, Gartenstrasse 17, Jagsthausen D-7109, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 29,325, Mar. 23, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,021

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 36102903

Int. Cl.[4] G09F *13/28*

U.S. Cl. 40—551 **6 Claims**

1. A low air resistance illuminated character shaped element for conforming application to the surface of a moving vehicle comprising in combination:

first and second insulating layers of deformable materials in contact with each other,

said first layer being in contact with a carrier layer serving as a support and including illuminating element conductor means associated therewith,

said second layer being in contact with a deformable arcuate shaped translucent cover member,

said second layer further having associated therewith at least one illumination member interconnected with said conductor means, and

layer assembly retention means along the edges of said cover member and said layers adapted to retain said cover member and said layers in superposed relationship.

4,879,827

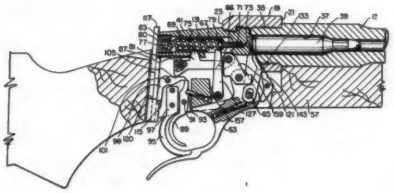
SINGLE SHOT FALLING BLOCK ACTION RIFLE

Roger Gentry, 5005 Coronet La., Arlington, Tex. 76017

Filed Feb. 5, 1988, Ser. No. 152,756

Int. Cl.[4] F41C *7/00*

U.S. Cl. 42—23 **8 Claims**



1. A single shot rifle, comprising:

a barrel having opposing ends;

a receiver mounted on one end of the barrel, the receiver having a forward face which joins the barrel and a rearward face separated by opposing sides which define a length, a width and an interior of the receiver, the rear-

ward face forming an arch-shaped opening into the interior;

a breechblock having a leading portion of lesser relative width than that of the receiver which extends within the interior of the receiver and which is slidably engaged within the arch-shaped opening of the receiver, the breechblock also having a trailing portion of lesser relative width than the receiver which extends outwardly from the arch-shaped opening of the receiver, whereby the breechblock is allowed upward and downward movement within the arch-shaped opening, the arch-shaped opening including a lip region which extends along the periphery of the opening, thereby defining an internal retaining ledge contained within the receiver interior adjacent the arch-shaped opening, the breechblock leading portion being provided with a mating region formed therein including a locking shoulder which contacts the retaining ledge within the receiver and breechblock as well as a recoil surface when the rifle is fired;

a stock containing the breechblock, barrel and the receiver; and

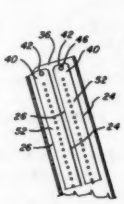
means for moving the breechblock upwardly and downwardly with respect to the receiver.

4,879,828

CONSTANT FORCE SPRING FOR CARTRIDGE MAGAZINES

Dale E. Dieringer, 7720 Teller St., Arvada, Colo. 80003, and Emil Vyprachticky, 7713 Webster Way, Arvada, Colo. 80004

Filed Feb. 29, 1988, Ser. No. 162,186
Int. Cl.[4] F41C *25/02*; F16F *1/10*
U.S. Cl. 42—50 **4 Claims**



1. In a constant force spring having side margins, a coiled portion and an uncoiled portion, the improved anti-curl feature for eliminating jamming when such spring is used to lift a stack of shells in a multiple cartridge magazine by means of a follower, which comprises: at least one column of longitudinally-spaced apertures spaced inwardly of the side margins and extending substantially the full length of at least the uncoiled portion and wherein the apertures comprises elongated slots extending lengthwise or diagonally of the spring.

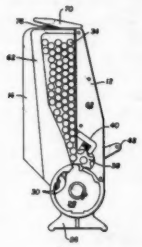
4,879,829

FAST CARTRIDGE LOADER FOR FIREARM MAGAZINES

Michael K. Miller, and Warren D. Stockton, both of 405 E. 19th St., Bakersfield, Calif. 93305

Filed Nov. 3, 1988, Ser. No. 266,575
Int. Cl.[4] F47B *39/06*
U.S. Cl. 42—87 **10 Claims**

1. In combination, a loader for a cartridge magazine, said magazine comprising means to receive cartridges of a predetermined size and to load said magazine with said cartridges, said loader comprising cartridge inserting means adapted to urge said cartridges one by one from said loader via said magazine cartridge receiving means into said magazine, said loader further comprising a first arm and a second arm, a cartridge platform fixed to one of said arms, a back wall joined to the other of said arms and positioned substantially parallel to said platform, said back wall and said platform being spaced apart from each other by a distance at least equal to the length of one of said cartridges of said predetermined size, means to hinge said arms to each other for motion on an axis substantially perpendicular to said platform and to said back wall, stop means defining a closed position and an open position of said arms with respect to each other, each of said arms also comprising a side wall, said loader being adapted to accept cartridges on said platform in said open position of said arms; said platform, said back wall, and said side walls on said arms all together in said closed position of said arms defining a predetermined volume at least equal to the volume of a relatively



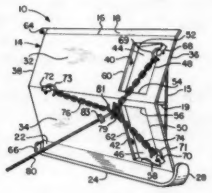
dense mass of a predetermined number of said cartridges of said predetermined size; said loader with said mass of cartridges in said predetermined volume being in a predetermined orientation with respect to the force of gravity when loading said cartridges into said magazine, and said loader comprising means to removably mount said magazine to be loaded with said cartridges in said loader with said magazine cartridge receiving means in a predetermined closely spaced relation to and below said loader's cartridge inserting means, whereby said mass of cartridges are fed through said loader and into said cartridge inserting means by the force of gravity.

4,879,830

TRAWL DOOR

Freddie W. Quick, 2001 Fulton St. P.O. Box 8125, Southport, Fla. 32409

Filed Dec. 16, 1988, Ser. No. 285,621
Int. Cl.[4] A01K *73/045*
U.S. Cl. 43—9.7 **20 Claims**



1. A trawl door comprising:

a rectangular sheet-like V-shaped member having an obtuse included angle about a central longitudinal axis forming two flat-faced portions on opposite sides of said central longitudinal axis, said member including a pair of louvers, one louver in each flat faced portion, each louver including a slat extending from a leading edge of each louver into a space between said opposite sides of said member within said obtuse included angle;

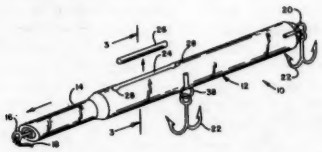
means for attaching a net tow cable arrangement to said member; and

means for attaching a trawl door tow cable arrangement to said member.

4,879,831
LIGHTING FISH LURE

Hermann H. Herrlich, 114 S. Coolidge Ave., Amityville, N.Y. 11701

Filed Apr. 8, 1988, Ser. No. 179,209
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—17.6 2 Claims



1. A lighted fish lure comprising:

a substantially cylindrical main body of transparent material having a hook attached thereto for catching a fish; and

a tubular cavity within said main body aligned along the longitudinal axis of said body for enclosing an elongated tubular light emitting stick whereby the light emitted from said stick will illuminate the main body, the diameter of said cavity being slightly larger than the diameter of said light emitting stick and the length of said cavity along its longitudinal axis being longer than the length of said light emitting stick, said cavity having a single opening thereto coextensive with the longitudinal extension of said light emitting stick and extending radially from said cavity to the exterior of said main body, said opening including a pair of opposing substrantially parallel walls spaced apart a distance approximately equivalent to the diameter of said light emitting stick and forming a snug channel through which the light emitting stick is inserted into and removed from said cavity, the longitudinally opposite ends of said opening beyond said channel being arcuate and slightly wider than the channel to provide access to a tool for removing said light emitting stick from said cavity.

4,879,832
FISHING LURE/HOOK RECEPTACLE

Maynard E. Nelson, 160 S. Estates Dr., Salina, Kans. 67401

Filed Sep. 23, 1988, Ser. No. 248,198
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—25.2 4 Claims

1. A fishing lure/hook receptacle operable to receive a fishing lure member attached to a fishing line therein, comprising:

(a) a main receptacle member;

(b) a receptacle cover member releasably mounted on said main receptacle member;

(c) said receptacle cover member having a slot section extended through one side thereof to receive the fishing line therethrough;

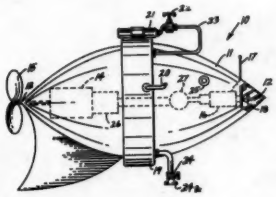
(d) said receptacle cover member when mounted on said main receptacle member operates to decrease a width of said slot section to clamp onto the fishing line; and

(e) said slot section is provided with a top slot portion integral with an offset arcuate slot portion whereupon said fishing line can be trained through said arcuate slot portion to said top slot portion.

4,879,833
SHARK DIVERTING APPARATUS

Trina A. Threlkeld, 18406 Avenida Bonita, Sonora, Calif. 95370

Filed Oct. 11, 1988, Ser. No. 255,951
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—26.1 9 Claims



1. A shark diverting apparatus for decoying sharks remote from a point of origin in travel of the apparatus through a water medium wherein said apparatus comprises,

an elongate body formed with a flotation collar surroundingly encompassing a circumference of said body, and

inflation means for selectively inflating said collar to enlarge its size, and

deflation means for slowly deflating said collar to decrease its size, and

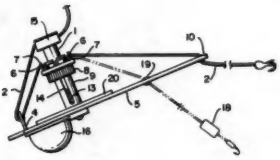
motor means for providing power to direct said body through said water medium, and

a signal generator to provide a shark attracting signal.

4,879,834
DEPTH PLANER AND RELEASE FOR SLIDING DOWN FISHING LINE

Ed Bohme, 509 - 825 Granville Street, Vancouver, British Columbia, Canada V6Z 1K9

Filed Oct. 11, 1988, Ser. No. 255,832
Claims priority, application Canada, Dec. 4, 1987, 553504
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—43.12 14 Claims



1. A fishing tackle depth planer with a release mechanism comprising:

(a) a plug having a hole through it adapted to receive a fishing line;

(b) a sleeve adapted to receive the plug;

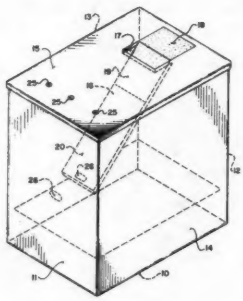
(c) ring means adapted to surround the sleeve and to compress the sleeve upon the plug, thereby increasing the force required to extract the plug from the sleeve;

(d) the ring means having holes through which a fishing line can be threaded and between which the fishing line can be intercepted by the plug as it is received by the sleeve.

4,879,835
EYELETLESS FISHING HOOK
James M. Sprayberry, 745 Ledyard Pl., Montgomery, Ala. 36109
Filed Dec. 27, 1988, Ser. No. 289,684
Int. Cl.[4] A01K 91/04
U.S. Cl. 43—44.83 3 Claims

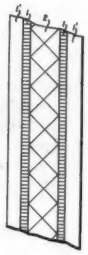
1. A fishing lacking an exterior accessible eyelet for connection to a fishing line comprising:
a hook with a barb and shaft,
an eyeletless gripping member,
said eyeletless gripping member being rigidly affixed longitudinally to the opposite end of the hook shaft from the hook barb, said gripping member further having a single open aperture which has a pair of opposite gripping surfaces with an inwardly facing bite surface into which an external flexible connecting means is disposed, said flexible connecting means passing sequentially through the gripping member around the hook shaft and returning parallel through the gripping member to the point of entry, said gripping member and flexible connecting means being affixed together by pressure closing the pair of opposite gripping surfaces of the aperture around the flexible connecting means thereby forming an extended integral unit, composed of an eyeletless hook with a gripping means gripping a flexible connecting means.

4,879,836
RODENT TRAP
Stanislaw Dolyny, 802-2nd Street East, Fort Frances, Ontario, Canada P9A 1N7
Filed Oct. 31, 1988, Ser. No. 265,394
Int. Cl.[4] A01M 1/12, 23/14
U.S. Cl. 43—64 10 Claims



1. A trap for rodents comprising a container having a base and side walls extending upwardly from the base to define a receptacle for water, a removable lid on the container arranged to substantially close the container, the lid defining a horizontal top platform for the container which constitutes the upper most surface of the trap, means defining an opening through the platform arranged adjacent one side wall and having a size which is a small portion of the platform and just to allow passage therethrough of the rodent, an elongate, straight continuous ramp surface and means mounting the ramp surface such that is remains in fixed stationary position relative to the container and extends from an upper end of a side of said opening adjacent said one side wall downwardly into the container, under the platform and across the container to a lower end at a position adjacent to but spaced from a side wall opposite to said one side wall of the container, the construction and inclination of the ramp being such that a rodent will commence to walk down the ramp but is inhibited from returning up the ramp, the depth o the side walls being sufficient to receive the height of the ramp and to receive a depth of water below the ramp which is sufficient to drown the rodent, a portion of the ramp surface adjacent the platform and a portion of the platform having a surface characteristic which is rougher than a portion of the ramp surface adjacent a lower end thereof.

4,879,837
DEVICE DEVELOPING AN ATTRACTIVE AND TOXIC ACTION FOR FIGHTING INSECTS
Amedeo Capizzi; Emilio Arsura, and Pia Spinelli, all of Milan, Italy, assignors to Istituto Guido Donegani S.p.A., Novara, Italy
Continuation of Ser. No. 843,723, Mar. 25, 1986, abandoned. This application Jan. 5, 1988, Ser. No. 142,245
Claims priority, application Italy, Mar. 25, 1985, 20054 A/85
Int. Cl.[4] A01M 1/20
U.S. Cl. 43—124 3 Claims



1. A device for combating noxious insects, consisting of a substrate of fibrils in the form of a paper of polyethylene in admixture with cellulose fibers, containing in an either adsorbed or dispersed form a pheromone, said substrate being partially coated with a layer impermeable to the pheromone consisting of a film of a substance selected from the group consisting of polyolefin, aluminum, nylon, polyester, polyvinylchloride, either alone or in admixture each other, or with other films, said layer carrying adhering to its external surface an insecticide or a substrate impregnated with an insecticide.

4,879,838
KNOCK-DOWN TOPIARY FORM
Rudy Vicenes, Cliffside Park, N.J., assignor to Speath Design, New York, N.Y.
Continuation-in-part of Ser. No. 30,546, Mar. 26, 1987. This application Sep. 21, 1987, Ser. No. 98,854
Int. Cl.[4] A01G 17/04
U.S. Cl. 47—45 17 Claims

1. A knock-down topiary form capable of being conveniently assembled for usage for defining a three-dimensional body-shape of a predetermined object and readily disassembled for compact shipment and storage, said knock-down topiary form comprising:
a vertically upstanding support member having upper and lower ends, the vertically upstanding support member having generally the shape of a body outline of the prede-

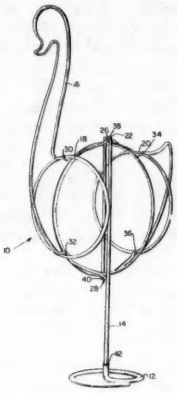
termined object formed by the perimeter of a midbody traverse plane section taken through the midbody portion of the predetermined object perpendicular to a longitudinal central plane formed by the body outline of said predetermined object, and having body-outline member receiving means at its upper end and at a position intermediate its upper and lower ends for engaging in a releasable manner another body-outline member,

at least three body-outline members,

said body-outline members each comprising a stiffly flexible, substantially flat element lying in a plane and each having a shape corresponding generally to the shape of a body outline of the predetermined object formed by the perimeter of a different predetermined plane section taken through the predetermined object,

a first of said body-outline members having generally the shape of a body outline of the predetermined object formed by the perimeter of a longitudinal central plane section taken along the longitudinal central plane of said predetermined object,

a second of said body-outline members having generally the shape of a body outline of the predetermined object formed by the perimeter of a forebody transverse plane section taken through a forebody portion of said predetermined object perpendicular to said longitudinal central plane of said predetermined object,



a third of said body-outline members having generally the shape of a body outline of the predetermined object formed by the perimeter of a rearbody transverse plane section taken through a rearbody portion of said predetermined object perpendicular to said longitudinal central plane of said predetermined object,

said first body-outline member having a first pair of opposed saddles located at two respective positions corresponding to the two positions where the body outline formed by the perimeter of said forebody transverse plane section intersects with the body outline formed by the perimeter of said longitudinal central plane section of said predetermined object,

said first body-outline member also having a second pair of opposed saddles located at two respective positions corresponding to the two positions where the body outline formed by the perimeter of said rearbody transverse plane section intersects with the body outline formed by the perimeter of said longitudinal central plane section of said predetermined object,

said first body-outline member being removably mountable in the body-outline member receiving means of said vertically upstanding support member,

said second body-outline member being removably mountable in said first pair of saddles with the plane of said second body-outline member being substantially perpendicular to the plane of said first body-outline member,

said third body-outline member being removably mountable in said second pair of saddles with the plane of said third body-outline member being substantially perpendicular to the plane of said first body-outline member, and

whereby said knock-down topiary form, being assembled by removably mounting said first body-outline member in said body-outline member receiving means on said vertically upstanding support member, removably mounting said second body-outline member in said first pair of saddles and by removably mounting said third body-outline member in said second pair of saddles with the respective planes of said vertically upstanding support member and said second and third body-outline members being substantially perpendicular to the plane of said first body-outline member, the assembled topiary form defining the three-dimensional shape of the predetermined object.

4,879,839

COATED SEEDS AND PROCESS FOR PREPARING THEM

Ignace Gago, Braine-l'Alleud, and René Detroz, Ohain, both of Belgium, assignors to Solvay & Cie. (Société Anonyme), Brussels, Belgium

Division of Ser. No. 679,355, Dec. 7, 1984, Pat. No. 4,735,017. This application Apr. 4, 1988, Ser. No. 177,168

Claims priority, application France, Dec. 12, 1983, 83 19983

Int. Cl.[4] A01C *1/06*

U.S. Cl. 47—57.6 **23 Claims**

1. Coated seeds comprising seeds coated with an anhydrous coating composition comprising:

a effective amounts of a polyester having a melting temperature of 80° C. or less, which polyester is a polymer of ϵ-caprolactone; and

one or more additives selected from the group consisting of plant protection products, beneficial bacteria, and fillers.

4,879,840

METHOD AND AN APPARATUS FOR MECHANIZED SETTING OUT AND HARVESTING OF CHICORY

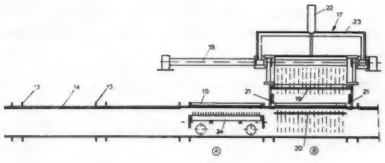
Jan W. den Daas, EV Zeddam, Netherlands, assignor to Kwekerij de Bollard B.V., Netherlands

Filed Jul. 7, 1987, Ser. No. 70,782

Claims priority, application Netherlands, Jul. 8, 1986, 8601784

Int. Cl.[4] A01G *31/00*

U.S. Cl. 47—58 **19 Claims**

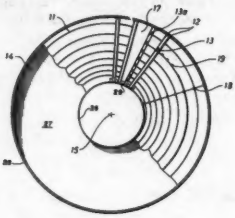


1. A method for mechanized setting up, raising and harvesting chicory comprising fixing chicory roots in rows on holder combs, each holder comb comprising an elongated support bar with extending stick up pins, said holder combs with chicory roots fixed on their stick up pins being subsequently placed in sprouting trays for raising chicory crops, and after raising removing said holder combs bearing raised chicory from said sprouting trays and separating the raised chicory crops from their roots still attached to said holder combs.

4,879,841
CONVEYOR

Jorgen Sjostrand, Odense, Denmark, assignor to Bronnums Maskinfabrik A/S, Kerteminde, Denmark

PCT No. PCT/DK87/00034, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/06094, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 3, 1987, Ser. No. 128,339
Claims priority, application Denmark, Apr. 7, 1986, 1564/86
Int. Cl.[4] A01G *9/14, 31/02*
U.S. Cl. 47—59 8 Claims



1. A system for continually increasing spacing between potted plants as the potted plants grow larger, comprising:

upright wall means providing a horizontal path which spirals radially outwards about a vertical central axis;

an arrangement of radially directed, angularly spaced guide rails superimposed upon said upright wall means and centered upon said central axis;

said arrangement of guide rails thereby dividing said path into a plurality of cells arranged in sectors which are separated angularly from one another by intervening ones of said guide rails, each said sector of cells comprising a series of radially adjacent cells which are separated by respective turns of said wall means;

means associated with said upright wall means for supporting pots of potted plants with sidewalls of the pots in contact with said wall means and said guide rails when the pots are disposed in respective ones of said cells;

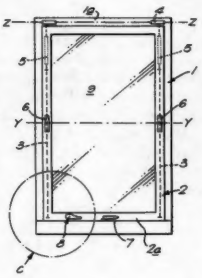
at least one of said upright wall means and said arrangement of guide rails being supported for rotation about said central axis, whereby, the plants in the pots can be provided with room to grow, by initially placing potted plants in at least some of the radially inner ones of said cells and, as the plants grow, rotating at least one of said upright wall means and said arrangement of guide rails in a sense to advance the potted plants in said radially inner ones of said cells radially outwards along said path.

4,879,842
EMERGENCY WINDOW SYSTEM

Frank Bailey, Burnley, England, assignor to Magnet PLC, Keighley, England

Filed Feb. 9, 1989, Ser. No. 308,016
Claims priority, application United Kingdom, Feb. 16, 1988, 8803571
Int. Cl.[4] E05B *65/10*
U.S. Cl. 49—141 10 Claims

1. A window comprising an outer frame for securing to a structure, a sash mounted by opposed pivot means for pivotal movement about a horizontal axis relative to said outer frame, the horizontal pivot axis lying intermediate the top and bottom of said outer frame, two opposed arms supported from said top of the outer frame with each said arm extending alongside a respective side member of said outer frame for confinement within the rebate between said outer frame and said sash when the sash is closed, each said arm being supported at its upper end by a hinge mounted on said outer frame, spring means acting between said outer frame and said arms to urge said arms in a direction outwards of said outer frame, a retainer mounted on said outer frame for engagement with catch means on the lower end of at least said arm to retain the arms alongside the respective side member of said outer frame against the force of said spring means to preclude pivotal movement of said arms about their respective hinges, said opposed horizontal pivot means being connected to said sash and to said arms whereby when said retainer is so engaged with said catch

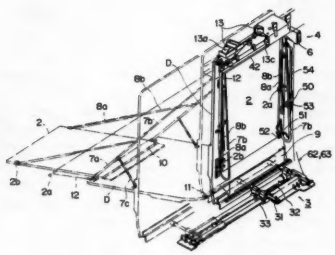


means said sash can be opened and closed relative to said outer frame in a normal mode pivoting about said intermediate horizontal axis, and an actuator mounted on said sash for disengaging said catch means from said retainer whereby said arms are released for hinged movement about their upper ends under the force of said spring means to displace said arms with said sash outwardly clear of the opening in said outer frame in which said sash seats when in the closed position.

4,879,843
DUAL PURPOSE DOOR SYSTEM

Atsushi Hamamoto, and Mikio Ichiki, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Sep. 14, 1987, Ser. No. 95,783
Claims priority, application Japan, Sep. 12, 1986, 61-214045
Int. Cl.[4] E06B *11/00*
U.S. Cl. 49—158 20 Claims



1. A dual-purpose door system, capable of being opened in two different modes, comprising:

a door frame defined within a supporting wall;

a door mounted within said door frame;

first means for opening said door in accordance with a first one of said two different modes by moving said door long a first path which comprises movement along a first path portion in a first direction, substantially perpendicular to a plane within which said door frame and said supporting wall are disposed, to a predetermined location point, and subsequently along a second path portion in a second direction substantially perpendicular to said first direction

and parallel to said plane within which said door frame and said supporting wall are disposed;

second means for opening said door in accordance with a second one of said two different modes by moving said door along a second path which comprises movement along said first path portion in said first direction, substantially perpendicular to said plane within which said door frame and said supporting wall are disposed, to said predetermined location point, and subsequently along a second path portion which is a continuation of said first path portion in said first direction beyond said predetermined location point so as to permit pivotable movement of said door about a lower edge portion thereof; and

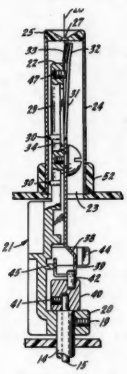
selector means operatively cooperating with said first and second means for selectively permitting operation of said first means, while preventing operation of said second means, when said door is to be opened in accordance with said first one of said two different modes; and for selectively permitting operation of said second means, while preventing operation of said first means, when said door is to be opened in accordance with said second one of said two different modes.

4,879,844

APPARATUS AND METHODS FOR SHARPENING POINTS

John E. Giles, 8614 Tarpon Springs Rd., Odessa, Fla. 33556

Filed Jul. 15, 1987, Ser. No. 73,572
Int. Cl.[4] B24B *19/16*
U.S. Cl. 51—31 **34 Claims**



1. Apparatus for sharpening a metal point comprising:

A. means for positioning said metal point in a predetermined location;

B. an abrasive surface for contacting said metal point:

C. means for reciprocating said abrasive surface while it is in contact with said metal point comprising first rotary means rotating at a predetermined speed; and

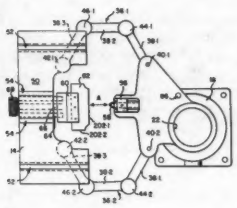
D. means for moving said abrasive surface around said metal point while said abrasive surface is reciprocating in contact with said metal point including second rotary means rotating at a slower speed than said first rotary means.

4,879,845

MACHINE TOOL

Francisco M. D. S. Nunes, P.O. Box G, Salamhof, 7532 Bellville, South Africa 7532

Continuation of Ser. No. 120,146, Nov. 13, 1987, abandoned.
This application Mar. 27, 1989, Ser. No. 328,809
Claims priority, application South Africa, Dec. 1, 1986, 86/9049
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—98.5 **13 Claims**



1. A machine tool comprising

a stand having a tool mount whereby a driven tool can be mounted on the stand; and

a work-table for supporting a work-piece to be machined by the driven tool;

first and second articulated cantilever arms secured to and extending from said stand and supporting said work-table;

each articulated arm being at one end connected to the stand so as to be pivotal with respect to the stand about a first vertical pivot axis, and being at the other end connected to the work-table so as to be pivotal with respect to the work-table about a second vertical pivot axis;

each articulated arm comprising at least two arm segments, adjacent arm segments of each respective arm being interconnected so as to be pivotal with respect to one another about a further vertical pivot axis; and

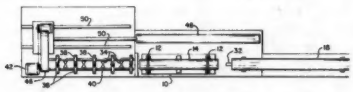
the pivotal connection of said first articulated arm to the stand being spaced horizontally from the pivotal connection of said second articulated arm to the stand, and the pivotal connection of said first articulated arm to the work-table being spaced horizontally from the pivotal connection of said second articualted arm to the work-table.

4,879,846

INGOT KNOCK OUT AND GRIND MACHINE

Alan W. Menard, Bolton, and Clifford B. Turner, East Hampton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 29, 1988, Ser. No. 226,349
Int. Cl.[4] B24B *21/00*
U.S. Cl. 51—137 **1 Claim**



1. An ingot knock out and grind machine comprising:

a support frame for horizontally supporting an ingot mold containing an ingot;

hold down means secured to said frame and engageable with said ingot mold for rigidly securing said mold to said support frame;

hydraulic ram cylinder coaxially aligned with a supported ingot mold;

knock out actuating means for actuating said ram cylinder for pushing said ingot from said mold;

a belt grinder traversable along said ingot when said longitudinal alignment with said ingot mold for receiving said ingot from said ingot mold;

a plurality of pairs of rolling rolls also located in substantial longitudinal alignment with said ingot mold for supporting and rolling said ingot;

transfer means for transferring said ingot from said receiving rolls to said rolling rolls comprising hydraulic support cylinders for raising and lowering said receiving roles with respect to said rolling rolls;

a belt grinder traversable along said ingot when said ingot is on said rolling rolls;

traversing means for traversing said belt grinder along said ingot for grinding the circumference of said ingot; and

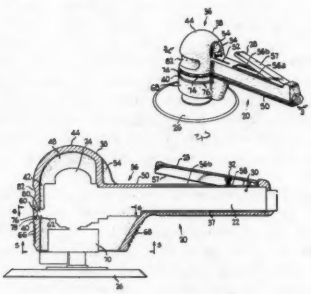
adjustment cylinders connected to said support frame for vertically aligning a supported ingot mole with said hudraulic ram cylinder.

4,879,847

COVER FOR PNEUMATIC TOOL

James K. Butzen, Grayslake, Ill.; Kenneth C. Happ, Silver Lake, and Robert D. Giese, Kenosha, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Mar. 13, 1989, Ser. No. 322,360
Int. Cl.[4] B24B *23/00*
U.S. Cl. 51—170 R **24 Claims**



1. A cover for use with a motor and handle extending from the motor and composed of a soft, resilient, fairly rigid, thermoplastic elastomeric material of one-piece construction, said cover comprising a first body portion including a sidewall and a dome extending from said sidewall and defining a cavity to receive said motor, said dome being spaced from said motor to define a chamber between said dome and motor which serves as a muffler to reduce noise, and a hollow second body portion extending from said first body portion and having a bore to receive said handle, said cover providing a comfortable grip and insulating the hands of a user during use, said cover protecting said motor and handle from damage if dropped, damping vibration of said motor and handle, and sufficiently shielding said motor to prevent injury to said user, said cover having an external surface which is aesthetically pleasing without additional cosmetic operations to said external surface.

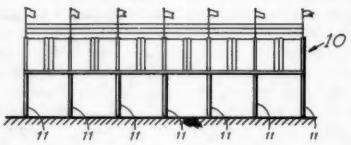
4,879,848

VIEWING STRUCTURE

Kenneth Gardner, and Rowland D. Hunt, both of Santa Barbara, Calif., assignors to Clamshell Partners, Ltd., Santa Barbara, Calif.

Filed Aug. 9, 1988, Ser. No. 230,404
Int. Cl.[4] E04H *3/12*
U.S. Cl. 52—8 **16 Claims**

1. A viewing structure comprising a plurality of parallel arched frames pivot means at each end of each frame, the pivot means at each end of a frame having a common axis; each frame having front, top and rear portions; said front portion comprising an arcuate section, said top portion comprising a plurality of straight sections and said rear portion comprising at least one straight section; the top portion joined at its front



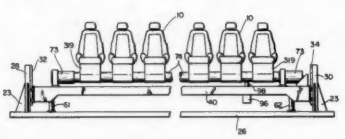
end to the top of said front portion and joined at its rear end to the top of the rear portion the top portion inclined upwardly and rearward at a predetermined angle; a plurality of support pillars mounted on each top portion, spaced apart thereon; seating members mounted on top of the pillars and extending transversely of said arches; and floor members mounted between said pillars.

4,879,849

POINT-OF-VIEW MOTION SIMULATOR SYSTEM

Fred Hollingsworth, III, and Julian G. Angus, both of Sarasota, Fla., assignors to Omni Films International, Inc., Sarasota, Fla.

Filed Nov. 4, 1987, Ser. No. 116,924
Int. Cl.[4] A63G *31/16*
U.S. Cl. 52—10 **15 Claims**



1. A motion simulation system comprising:

a theater having a seating area, a viewing area and a projection area;

means for projecting a moving image from said projection area to said viewing area;

a stationary base positioned within said seating area;

a plurality of adjacent seats movably positioned on said stationary base between said projecting and viewing areas;

moving means for controllably moving said seats in a plurality of directions of movement relative to said stationary base, all of said seats during the entire operation of said motion simulation system moving at the same time, in the same pattern, and being displaced from said base by the same amount, said directions of movement for each of said seats including up-and-down, side-to-side, tilt side-to-side and rotation forward-and-back, and

electronic circuit means for controlling said hydraulic moving means to synchronize the movements of said seats with the images being projected on said viewing area.

4,879,850

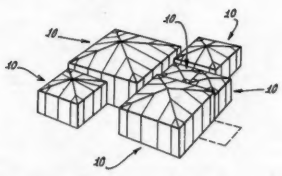
MODULAR BUILDING CONSTRUCTION AND METHOD OF BUILDING ASSEMBLY

Robert B. Glassco, Pasadena, Calif., and Robert L. Noble, Carrollton, Tex., assignors to Mansion Industries, Inc., City of Industry, Calif.

Continuation of Ser. No. 797,668, Nov. 13, 1985, Pat. No. 4,748,777. This application May 2, 1988, Ser. No. 188,834

Int. Cl.[4] E04C *2/16*

U.S. Cl. 52—82 27 Claims



1. A modular building, comprising:

(a) four upright walks together forming an enclosure, each of the walls including a succession of upright panels extending in a common plane, successive panels of each wall having upright lateral edges which are joined together in edge-abutting relation at joints formed therebetween, only the said panels defining the said building four walls, certain of said panels joined together to form vertical corners of the enclosure,

(b) the wall panels having uppermost edges which extend horizontally in a common horizontal plane,

(c) horizontally elongated support members with horizontal undersides mounted on and seated downwardly in flush engagement with said panel upper horizontal edges, said support members extending to and between said corners of the enclosure, each of said members having an upper support surface, the support member upper surfaces being located above said horizontal undersides of the support members,

(d) a pyramid shaped roof extending over the enclosure and defined by four like roof sections spaced about a vertical axis intersecting a peak formed by a common intersection of the four roof sections, each section including at least two roof panels extending in a common plane inclined upwardly toward said peak,

(e) said two roof panels of each section having:

(i) lower edge portions supported by a support member upper surface as defined, and

(ii) first lateral edge portions joined together in edge abutting relation and extending upwardly generally toward said peak,

(f) and the said roof panels of adjacent sections having second lateral edge portions joined together in edge abutting relation to support the sections laterally above the level of said plane defined by the support members, said second lateral edge portions located along lines extending diagonally from said corners to said peak,

(g) all of said wall and roof panels consisting essentially of low-strength fibrous material in compacted state, to a density of about 16 to 23 pounds per cubic foot, and a modulus of elasticity of about 17,500 to 21,500 psi, and at least two inches of thickness,

(h) adhesive mastic in said joints acting to bond successive wall panels together,

(i) tape strips bonded to successive panels of each wall at and along said upright lateral edges thereof, at outer side surfaces of the panels adjacent said edges, and at inner side surfaces of the panels, thereby bridging said joints,

(j) said tape strips comprising substantially the only joint overlapping interconnection of the panels, at and along the edges thereof,

(k) successive roof panels also bonded together and connected together as are said successive wall panels,

(l) said support members with said roof supported thereon providing a lateral stiffening means for restraining bowing of the tape and mastic interconnected wall panels.

4,879,851

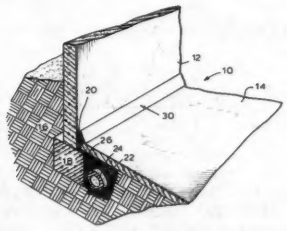
HOLLOW KICK MOLDING

Joseph Boccia, 131 Searingtown Rd., Albertson, N.Y. 11507

Filed Feb. 18, 1988, Ser. No. 157,219

Int. Cl.[4] E02D *19/00*

U.S. Cl. 52—169.5 7 Claims



1. A drainage system for draining water away from the interior of a building located on the ground having a surface above which a portion of the building extends, said building having a horizontally disposed base lying adjacent the ground, walls extending vertically from said base and a horizontally disposed floor located inside said walls spaced from said walls and defining therewith a continuous space for the passage of moisture therebetween, the drainage system comprising drain means deposed in a trench in the ground adjacent said base and extending around the perimeter of said floor inside said walls and beneath said space between floor and said walls, a molding comprising an elongated strip having a flat vertically disposed body provided with a straight lower edge and a shaped crown, said crown including a flat lower wall and an enclosed roof having straight upper edge, said molding having its vertically disposed body extending downwardly through said space between the wall and said floor in abuttment with the peripheral edge of said floor so that the lower wall of the crown rests on said floor and the upper edge of the enclosed roof extends toward said wall hiding said space.

4,879,852

APPARATUS FOR MAINTAINING SOIL MOISTURE

Kenneth C. Tripp, 2712 Jennifer Clr., College Station, Tex. 77840

Filed Feb. 3, 1989, Ser. No. 305,775

Int. Cl.[4] E02D *31/00*; B05B *1/14*

U.S. Cl. 52—169.5 8 Claims

1. A soil moistening apparatus for the periphery of a house, building, or the like comprising:

a water supply means comprising piping,

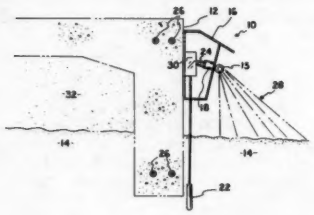
a water sprinkling means comprised piping,

said water sprinkling means having a plurality of perforations allowing for the discharge of water,

said water sprinkling means being divided into sections along its length by a plurality of vertical dividing plates,

said water sprinkling means having along its length in at least one position between said vertical dividing plates a control valve means whereby the flow of water may be selec-

tively controlled into the sections of the sprinkler means, and



said water supply means connected to said water sprinkling means.

4,879,853

VEHICLE WINDOW AND A METHOD OF MANUFACTURING THE WINDOW

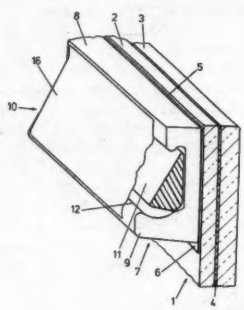
Jürg G. Braendle, Baech, and Saur Wolfgang, Buttikon, both of Switzerland, assignors to Gurit Essex AG, Freienbach, Switzerland

Filed Oct. 11, 1988, Ser. No. 255,641

Claims priority, application Switzerland, Oct. 14, 1987, 4026/87; Apr. 20, 1988, 1497/88

Int. Cl.[4] E06B *3/00*

U.S. Cl. 52—208 19 Claims



1. A prefabricated vehicle window adapted to be directly glued into a frame, a flange or the like, comprising

a primer layer applied onto an edge portion of the vehicle window;

a first profiled bead consisting of an already cured adhesive material applied onto said primer layer extending along an edge portion of said vehicle window;

said already cured adhesive material having elastic properties but cannot be plastically deformed;

said first profiled bead having a generally U-shaped cross section whereby the two legs of the U-shaped profile have different height, a first leg remote from the edge of the vehicle window having a greater height than a second leg adjacent to the edge of the vehicle window;

said first profiled bead having a tub-like recess receiving a second bead consisting of a plastically deformable and/or activatable adhesive material which is chemically compatible with respect to the material of said first profiled bead.

4,879,854

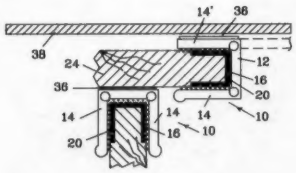
HOOK AND LOOP PARTITIONING SYSTEM

Michael D. Handler, Norwalk, Conn., assignor to Velcro Industries B.V., Amsterdam, Netherlands

Continuation of Ser. No. 893,382, Aug. 5, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 161,337

Int. Cl.[4] E04B *2/82*

U.S. Cl. 52—238.1 10 Claims



1. A partitioning system for offices and the like for releasably attaching partitioning components, the improvement comprising at least one preformed planar wall partition, a structure to which said wall partition is to be attached, and a touch fastening system having interconnectable first and second portions, said first portion carrying a plurality of projecting elements capable of releasably engaging cooperating projecting elements carried by said second portion, for releasably fastening said partitioning components together, said touch fastening system comprising:

(a) said preformed planar wall partition having parallel outer faces, at at least one end thereof, said outer faces carrying said first portion of the touch fastening system thereon; and,

(b) at least one U-shaped channel member, carried by said structure, having a resiliently rigid back portion interconnecting a pair of resiliently rigid opposed side portions defining inner faces, each inner face having said second portion of the touch fastening system thereon, said back portion of said U-shaped channel member being of a width so that when said U-shaped channel member receives said parallel outer faces of said end between said inner faces, with the first and second portions of the touch fastening system engaged, said inner and outer faces are substantially parallel to one another and the touch fastening system acts in shear to attach said components together, said U-shaped channel member having at least one of said side portions pivotable adjacent the closed end of the U to allow progressive disengagement of the touch fastening system when desired.

4,879,855

ATTACHMENT AND REINFORCEMENT MEMBER FOR MOLDED CONSTRUCTION FORMS

John L. Berrenberg, 3704 Valerie, NE, Albuquerque, N. Mex. 87111

Filed Apr. 20, 1988, Ser. No. 183,730

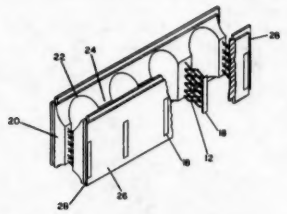
Int. Cl.[4] E04C *1/08*

U.S. Cl. 52—309.11 8 Claims

1. In a molded construction form having two sidewall members of rectangular configuration having horizontal and vertical edges, and each of said members having a respective inner surface and a planar outer surface, comprising in combination:

(a) a plurality of cross members of expanded material with at least one angularly extending end, transversely connecting between said sidewall members, and

(b) a plurality of attachment surfaces, U-shaped in a side elevation, embracing said angularly extending end, forming a uniform continuous planar surface, coplanar with said outer surface of said sidewall member.



4,879,856

FLOOR SYSTEM

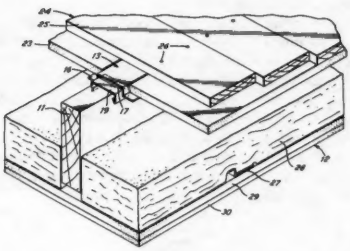
Philip E. Jones, West BridgeFord, and Robert Highet, Keyworth, both of United Kingdom, assignors to BPB Industries Public Limited Company, Sleigh, United Kingdom

Filed Oct. 27, 1988, Ser. No. 263,195

Claims priority, application United Kingdom, Oct. 29, 1987, 8725314

Int. Cl.[4] E04B *1/74*

U.S. Cl. 52—403 **10 Claims**



1. A flooring system comprising: a plurality of spaced apart joists having respective upper edges; floor supports mounted longitudinally on said joists, each support being of inverted channel cross-section including two opposed side walls embracing said edge of a respective joist, and each support including outwardly directed longitudinal flanges extending along said opposed side walls; sound isolating material in each said support channel between the channel and the respective joist; at least one self-supporting panel member supported at opposite edges solely by neighbouring flanges of the floor supports on two adjacent joists; and floor decking extending over the panel member and secured to the floor supports.

4,879,857

RESILIENT LEVELER AND SHOCK ABSORBER FOR SPORT FLOOR

David L. Peterson, and Michael J. Peterson, both of Oakdale, Minn., assignors to Sport Floor Design, Inc., Maplewood, Minn.

Continuation of Ser. No. 873,999, Jun. 13, 1985, abandoned. This application Jun. 10, 1988, Ser. No. 206,977

Int. Cl.[4] E04F *15/22*

U.S. Cl. 52—403 **14 Claims**

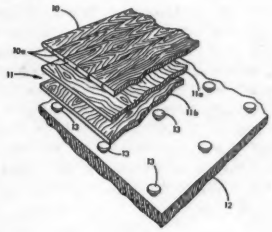
1. A floor construction for providing resilient support, comprising:

(a) a continuous playing surface;

(b) a continuous subflooring in continuous contact with and directly supporting said playing surface;

(c) a rigid solid base beneath said subflooring; and

(d) a plurality of resilient, shock-absorbing members, said shock-absorbing members being uniformly spaced apart and being located between said subflooring and said base so as to support said subflooring and playing surface, each of said shock-absorbing members including a first base portion in contact with said subflooring, said first base portion being frusto-spherical in shape, and a second portion having a domed surface in contact with said base said second portion being semi-spherical in shape, said first base portion having a greater diameter than said second portion so as to form an annular rim, wherein said domed surface becomes increasingly flattened proximate the point of contact of said domed surface with said base in response to increasing force upon said playing surface.



4,879,858

METHOD OF INSTALLING A BATHING VESSEL

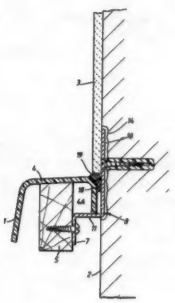
Ian S. Murdoch, N. Humberside, England, assignor to American Standard Inc., New York, N.Y.

Filed Mar. 7, 1988, Ser. No. 176,481

Claims priority, application United Kingdom, May 3, 1987, 8705115

Int. Cl.[4] E04F *19/02*; E04G *21/00*

U.S. Cl. 52—741 **1 Claim**



1. A method of installation, in sealed relationship against at least one vertical wall, a bathing vessel of the type having a sump to contain water therein and a water drain outlet, the bathing vessel including a horizontal rim extending away from the sump and a depending skirt formed around the horizontal rim, said method comprising:

providing a frame assembly and positioning said sump of said bathing vessel therein;

supporting said bathing vessel along the upper surface of said frame so that said depending skirt lies adjacent said at least one vertical wall;

providing a sealing strip and positioning said strip between said depending skirt and said at least one vertical wall, said sealing strip having parallel extending flanges spaced from each other by a horizontal web;

mounting at least one of said flanges to its corresponding vertical wall and frame and establishing a gap between said wall and said horizontal rim, applying a first sealing compound to form a seal between said depending skirt and one of said opposed flanges and allowing said first seal to cure and subsequently applying an outer seal adjacent to said first seal in said gap between the wall and the horizontal rim so that any movement of said bathing vessel will shift said sealing strip and said sealing compound to maintain its sealing relation between said depending skirt and the at least one of said parallel flanges, thereby preventing water from penetrating below said rim of said bathing vessel wherein at least one of said flanges of said sealing strip nests in a recess formed in at least one of said vertical walls so that the outer surface of said plane and said wall are substantially coplanar.

4,879,859

METHOD AND APPARATUS FOR CONSTRUCTING CIRCUMFERENTIALLY WRAPPED PRESTRESSED STRUCTURES UTILIZING A MEMBRANE

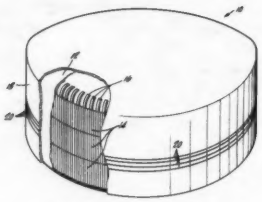
Max J. Dykmans, 1214 Pioneer Way, El Cajon, Calif. 92022-0696

Continuation-in-part of Ser. No. 559,911, Dec. 9, 1983, Pat. No. 4,776,145. This application Oct. 3, 1986, Ser. No. 915,269

The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.[4] E04B *1/16*

U.S. Cl. 52—741 **56 Claims**



1. A process for forming a domed structure with walls of composite construction on a base, comprising the steps of:

(a) locating on said base an inner membrane and inflating said membrane;

(b) placing a plurality of wall forms adjacent and inwardly to said membrane;

(c) radially supporting said plurality of wall forms by utilizing at least one truss assembly attached to said plurality of wall forms;

(d) applying fiber reinforced plastic material outwardly of said membrane;

(e) prestressing said fiber reinforced plastic by circumferentially wrapping wire, having a compressibility less than said wall forms, outside said fiber reinforced plastic material;

(f) applying a layer of fiber reinforced plastic outwardly of said wire wrapping;

(g) applying additional alternating layers of circumferential wire prestressing and fiber reinforced plastic material;

(h) removing said truss assembly and plurality of wall-form supports and deflating said membrane.

4,879,860

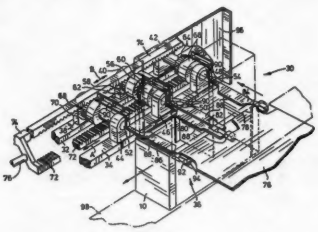
CARTON LOADING MACHINES

Marinus J. M. Langen, Toronto, and Peter Guttinger, Milton, both of Canada, assignors to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Oct. 28, 1988, Ser. No. 264,074

Int. Cl.[4] B65B *1/04, 5/06, 39/00*

U.S. Cl. 53—247 **7 Claims**



1. In a carton loading machine for use in loading items into a carton of the type which has two load storage compartments which are separated from one another by a divider wall and which has an end wall located opposite the divider wall, each compartment having an entrance which opens therefrom which is located between the divider wall and one of the end walls, the carton loading machine having first and second loading stations arranged in a side-by-side relationship in which a carton is located with its divider wall separating the stations in use, the improvements of;

first and second gate members mounted above said loading stations for pivotal movement between a first position in which the gate members extend laterally inwardly with respect to one side of the divider wall and are located above the first and second loading stations respectively and a second position in which they extend into the first and second loading stations respectively, one on either side of a divider wall of a carton in use to support the divider wall and guide load items into the load storage compartments.

4,879,861

METHOD FOR PACKAGING FIREWOOD AND THE APPARATUS THEREOF

William J. McAdams, 3006R N. Main St., Ft. Worth, Tex. 76106

Filed Apr. 20, 1988, Ser. No. 183,903

Int. Cl.[4] B65B *53/06, 67/08*

U.S. Cl. 53—435 **8 Claims**

1. A method for producing packages of firewood comprising the steps of;

cutting trees to produce substantially constant lengths of logs,

splitting said logs to provide firewood lengths having irregularly configured peripheral surfaces,

setting up a support frame having a base member including an elevated platform thereupon, said platform defining lateral dimensions less than that of said firewood lengths, said base member having front and rear portions, a vertical support member movably attached to said base member rear portion and braced by a truss member removably bracing said support member to said base member front portion,

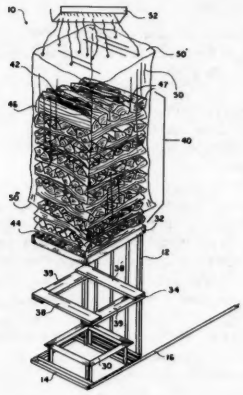
placing a substantially square support retainer member atop said platform, said support retainer member having side dimensions substantially equal to the length of said firewood lengths and projecting laterally a substantial distance beyond said platform therebeneath,

depositing a substantially horizontal layer of parallel juxta-

posed ones of said firewood lengths upon said retainer member to form a bottom most firewood layer,

depositing succeeding substantially horizontal layers of parallel juxtaposed ones of said firewood lengths atop previously deposited ones of said layers with each said succeeding layer having said firewood lengths disposed with their longitudinal axes offset substantially 90 degrees from the longitudinal axes of the firewood lengths of the preceding layer,

utilizing said vertical support member as a guide during said depositing of succeeding layers to facilitate maintenance of vertical alignment between said layers,



moving said truss member and vertical support member away from said deposited layers,

placing a bag of shrink wrap material having an open end about said layers of firewood lengths with said open end disposed below said support retainer member, and

applying heat to said bag beginning at said open end to cause said bag to shrink with said open end closing beneath said support retainer member short of said elevated platform with the balance of said bag shrinking to tightly wrap and retain all said firewood lengths in a unitary stable bundle containing said support retainer member.

4,879,862

PROCESS FOR AUTOMATICALLY PACKAGING LETTER ENVELOPES AND MAILING WALLETS INTO A CONTAINER AND AUTOMATIC PACKAGING MACHINE FOR CARRYING OUT THE PROCESS

Bert Nolte, Kirchheim, and Siegfried Leonhardt, Stuttgart, both of Fed. Rep. of Germany, assignors to Otto Ficker AG, Kirchheim/Teck, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,372

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1986, 3641859

Int. Cl.[4] B65B *57/20, 35/30*

U.S. Cl. 53—438 **41 Claims**

1. A process for packaging into a container envelope-like articles which exit serially from a production machine, comprising the steps of:

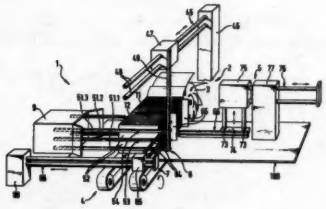
serially collecting a packaging batch comprising a plurality of envelope-like articles;

counting the envelope-like articles to identify periodically an individual article of the packaging batch which corresponds to a specific batch size of a stack to be packaged, said individual article constituting a counting article, wherein said counting step further comprises moving the counting article a predetermined distance laterally with respect to the conveying direction so that it protrudes;

conveying the packaging batch at least semi-continuously in a conveying direction in relation to the further individual articles which are supplied to the packaging batch;

moving a supporting part in the conveying direction in front of the head of the packaging batch at a speed equal to supply of the further individual articles to the packaging batch to thereby keep the batch at least approximately vertical;

when the counting article arrives at a separation point located at a predetermined distance in the conveying direction, inserting a separating part transversely relative to the conveying direction of the batch between adjacent envelope-like articles at least in the vicinity of the counting article, to define the stack and temporarily stop a portion of the packaging batch upstream of the stack, wherein said inserting step comprises first engaging and halting the



protruding counting article at one edge with the separating part, whereupon a gap is formed downstream of the Counting article, and thereafter inserting the separating part into the gap;

after the separating part has been inserted between the stack and the upstream portion of the packaging batch, moving the supporting part a predetermined distance in a direction opposite to the conveying direction to thereby compress the stack to a stack length which is less than the horizontally measured width of the container;

filling the compressed stack into the container in a direction transverse to the conveying direction; and

after the stack has been transferred into the container, moving the supporting part to the separation point and retracting the separating part out of the path of movement of the upstream portion of the packaging batch.

4,879,863

APPARATUS FOR PACKAGING AN ARTICLE BY MEANS OF HEAT-SHRINKABLE FILM

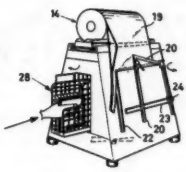
Pietro Di Bernardo, Milan, Italy, assignor to Interdibipack S.p.A., Milan, Italy

Filed Jul. 19, 1988, Ser. No. 223,065

Claims priority, application Italy, Jul. 24, 1987, 21421 A/87

Int. Cl.[4] B65B *9/08, 53/06, 67/04*

U.S. Cl. 53—557 **4 Claims**



1. A compact machine for packaging articles in heat-shrinkable film comprising a box-shaped housing having vertically extending side walls, a top wall and a bottom wall and defining therein a thermal shrinking chamber, a support means mounted

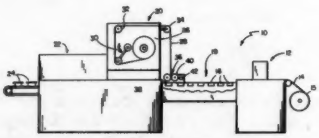
on the top of the housing for rotatably supporting a roll of two ply heat-shrinkable film so that it can be pulled down over one side wall of the housing, a support on the outside of said one side wall of the housing for holding an article that has been inserted between the plys of the film, sealing means pivotally mounted on said one wall adjacent the support for sealing at least one edge of said film together and for separating the wrapped article from the roll of film, heating means for heating the air within said chamber, an opening located in a different side wall of the housing for access to the chamber, a door for closing the opening and means for holding the wrapped article separated from the film adapted to be inserted into and supported within the chamber and removed therefrom through said opening.

4,879,864

FORM, FILL, AND SEAL APPARATUS

Francis P. Ventura, Upton, Mass., assignor to T W Kutter Inc., Avon, Mass.

Filed May 2, 1988, Ser. No. 189,025
Int. Cl.[4] B65B *47/00*
U.S. Cl. 53—559 **17 Claims**



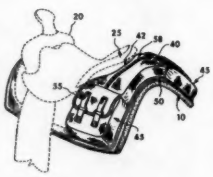
1. Form and fill packaging apparatus comprising
a thermoformer where a first plastic web is formed to provide formed receptacles for receiving articles,
a filling station where articles ° re placed in the formed receptacles,
a sealing station where a second web is placed over the filled receptacles and sealed to -portions of the web around the receptacles,
first web drive means for advancing said first web through said thermoformer, filling station and sealing station, and
a feed mechanism that positively feeds said second web to said first web at said sealing station synchronously with the advancing of said first web.

4,879,865

SADDLE BLANKET WITH COMPARTMENTS

Pershing R. Van Scoyk, 7193 W. 32nd Ave., Wheat Ridge, Colo. 80033

Filed Jul. 29, 1988, Ser. No. 226,129
Int. Cl.[4] B68C *1/12, 1/20*
U.S. Cl. 54—66 **13 Claims**



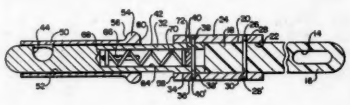
4. A saddle blanket for use with a horse saddle having a cantle and a skirt comprising at least one compartment having only its outermost edges attached along the periphery of the rear end portion of said saddle blanket to allow said skirt of said saddle to fit between said at least one compartment and said blanket.

4,879,866

HEAD POLE

Howard G. Millington, 29 Perry Rd., Cable, Ohio 43009

Filed Jun. 27, 1988, Ser. No. 211,590
Int. Cl.[4] B68B *1/00*
U.S. Cl. 54—71 **2 Claims**



1. A head pole adapted to engage a halter ring at one end and a saddle strap at the other end to prevent lateral movement of a horse's head comprising:
a rod;
a saddle strap receiving means at one end of said rod adapted to receive said strap;
a coupling member having one end receiving the other end of said rod;
a piston affixed to the other end of said coupling member wherein said piston projects away from said rod;
a slidable sleeve having an inner end adjacent said coupling member, an outer end remote from said coupling member, an outer surface and an axial bore defining an inner surface adapted to slide over the outer surface of said piston;
an opening formed in said piston adapted to receive said halter ring;
a pair of slot adjacent the outer end of said sleeve which slots overlie said piston opening;
said sleeve movable between a first position which said sleeve outer end overlies and covers said piston opening and a second position in which said sleeve outer end is remote from said opening such that said piston opening is uncovered to receive or discharge said ring;
wherein said ring is received within said slots when said ring is received with said piston opening;
spring means for biasing said sleeve into said first position, and
a rounded raised shoulder formed on the outer surface at the inner end of said sleeve wherein said raised shoulder projects radially outwardly from said sleeve outer surface to thereby provide a lateral thrust surface to enable an operator to push against said thrust surface in a direction parallel to the longitudinal axis of said sleeve and thereby move said sleeve from said first position to said second position.

4,879,867

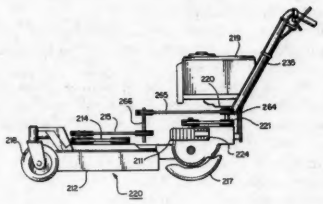
SELF-PROPELLED MOWER WITH HYDROSTATIC DRIVE

Philip H. Wenzel, Vernon Center, N.Y., assignor to Ferris Industries, Inc., Oneida, N.Y.

Continuation-in-part of Ser. No. 63,007, Jun. 17, 1987, Pat. No. 4,787,195. This application Nov. 28, 1988, Ser. No. 276,912
Int. Cl.[4] A01D *69/06*
U.S. Cl. 56—11.1 **12 Claims**

1. A self-propelled mower that comprises
a front mower deck housing a blade assembly containing one or more movable blades;
a rear power deck containing an engine, a pair of drive wheels and a power train coupling the engine to the drive wheels, wherein the engine has a vertically disposed output shaft positioned over the power deck, and power takeoff means for connecting the blade assembly to said output shaft;
handle bar attached to the back of the power deck for steering the drive wheels;
said power train including a hydrostatic transmission having an input shaft means connected to the engine, an output

means, differential means having an input coupled to the hydrostatic transmission output means and a pair of differential output shafts serving as drive axles for said drive wheels, and a speed regulator to set the speed ratio of the differential output shafts to the input shaft means within a continuous range from reverse through neutral, wherein said output shaft is idle, to maximum forward; and



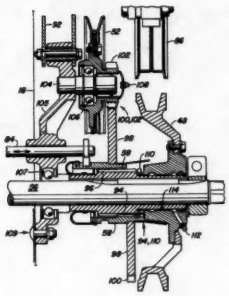
control lever means positioned on the handle means that is connected to the speed regulator for setting said speed regulator at any desired position within said continuous range so that the operator can select a desired wheel speed without releasing the handle means or uncoupling the transmission from the engine.

4,879,868

REVERSER FOR HARVESTING APPARATUS

Mahlon L. Love, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 23, 1988, Ser. No. 197,473
Int. Cl.[4] A01D *69/08*
U.S. Cl. 56—11.2 **16 Claims**



1. In a mobile agricultural machine having a crop processing unit, a feeding unit for transporting a crop to the processing unit, and a power source on the machine for driving the units, the combination therewith of an improved drive system for the feeding unit, comprising:

a first drive sheave drivingly connected to the power source;

a first driven sheave;

a first drive belt drivingly trained around the first drive sheave and the first driven sheave;

a second drive sheave drivingly connected to the power source;

a second driven sheave;

a second drive belt drivingly trained around the second drive sheave and the second driven sheave;

a transmission having an input selectively connected to the first driven sheave and the second driven sheave and an output drivingly connected to the feeding unit and including a driving element selectively shiftable between a forward position and a reverse position so that for a given driving direction of the input, the driving direction of the output is reversed and the feeding unit is driven in forward and reverse directions respectively, and

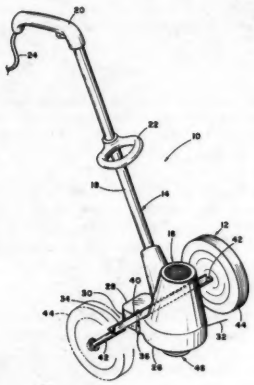
control means for shifting the driving element of the transmission between its forward and reverse positions.

4,879,869

GRASS TRIMMER ATTACHMENT

Rudy R. Buckendorf, Jr., 4111 S. 43d W. Ave., Tulsa, Okla. 74107

Filed May 14, 1987, Ser. No. 49,624
Int. Cl.[4] A01D *31/67, 34/84*
U.S. Cl. 56—12.7 **13 Claims**



1. A wheeled attachment for a grass trimmer, in which the trimmer includes:

an elongated shaft,

a grass cutting head including a grass cutting element adjacent a first end of the elongated shaft, the head further including (a housing positioned above the grass cutting element,)

a first and a second handle on the elongated shaft for holding the grass trimmer with both hands during operation, and

power means for driving the grass cutting element, comprising:

a mounting member comprising a straight transverse member having a wheel assembly at each end thereof, the mounting member mounted on an upper side of the housing, and

means for securing the mounting member detachably in position on the trimmer in a manner that the transverse member is mounted rearwardly of a vertical axis of the cutting element.

4,879,870

MOWER WITH IMPROVED STIFFENING OF THE CUTTING BAR

M. Horst Neuerburg, Saverne, France, assignor to Kuhn S.A., Saverne Cedex, France

Filed Nov. 30, 1988, Ser. No. 277,940
Claims priority, application France, Dec. 21, 1987, 87 18131
Int. Cl.[4] A01D *34/66, 34/86*
U.S. Cl. 56—13.6 **19 Claims**

1. A mower comprising:

(a) a frame; and

(b) a cutting bar made of one or more sections and comprising cutting elements mounted on it, said cutting bar having two ends,

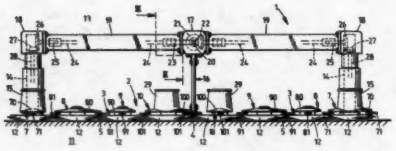
wherein:

(c) said cutting bar is of a relatively slight thickness;

(d) said cutting bar is connected to said frame by means of a first connecting element extending in the vicinity of each one of said two ends of said cutting bar;

(e) said cutting bar is connected to said frame by at least one second connecting element extending between said two first connecting elements, said second connecting element having a front edge;

(f) on each side of said second connecting element is pro-



vided a transport element rotating around an axis pointed upwardly, the direction of rotation of said two transport elements being such that their movements of rotation diverge toward the front, seen in the direction of work; and

(g) the front edge of said second connecting element extends toward the rear and downwardly to the vicinity of a cutting plane of said cutting elements and in an operational zone of said two transport elements.

4,879,871

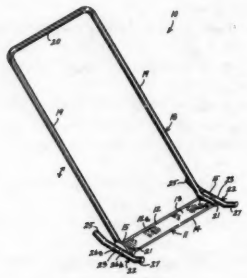
BEACH COMBING APPARATUS

Eldor W. Kunschke, 149 S. Shioc St., Bonduel, Wis. 54107, and Lee Nernberger, Rte. 1, Box 25, Cecil, Wis. 54111

Filed Nov. 7, 1988, Ser. No. 268,563

Int. Cl.[4] A01B *1/22*; A01D *1/00*

U.S. Cl. 56—239 **4 Claims**



1. A beach combing apparatus comprising,

an elongate cutting edge coextensive along a forward side of an elongate planar central support, and said cutting edge directed outwardly of said central support, and

a curvilinear overfolded end formed coextensively along a rear edge of said central support and spaced parallel from said cutting edge at the other side of said cutting means to present a smooth non-binding surface directed outwardly of said cutting means in the direction opposite to that of said cutting edge, and

a plurality of elongate skid members wherein each skid member is secured to each end of said elongate cutting means and each skid member aligned orthogonally to said cutting edge and to said non-binding surface of said curvilinear overfolded end, and each skid member formed with a central body aligned with the central support and intersecting a plane defined by the central support with an upturned forward end aligned with said central support at an obtuse angle thereto and oriented in a like direction as said cutting edge, and a rear upturned end aligned with said central support and oriented opposite the direction of said cutting edge, and

upstanding brackets are integrally and orthogonally secured relative to said central support at terminal ends of said central support orthogonal to and defining terminal ends bounding said cutting edge and said curvilinear surface wherein said brackets are formed with a plurality of through-extending apertures, and

a handle means including spaced terminal end portions each mounted to one of said brackets overlying said central support, and

wherein said terminal end portions limit upward pivotment of said handle means relative to said cutting means upon engagement with an upper surface of said central support, and each of said skid members secured to an exterior surface of a bracket and each terminal end portion of the handle secured to an interior surface of a respective bracket, and said central support includes a lower planar surface coextensive and terminating in said cutting edge at one side thereof and terminating and accepting a free edge of said overfolded edge of said curvilinear end at a spaced side, and said central support formed with an upper planar surface free of obstruction terminating with a bevel directed downwardly to said cutting edge along one side and terminating in said overfolded end forming a curvilinear surface parallel to and spaced from said cutting edge on said spaced side.

4,879,872

APPARATUS FOR POSITIONING A RING RAIL OF A TEXTILE MACHINE

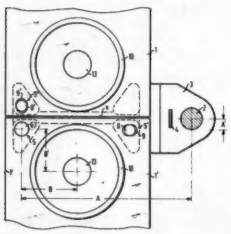
Jakob Bothner, Goppingen-Jenhausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 315,343

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1988, 3806203

Int. Cl.[4] D01H *7/10*

U.S. Cl. 57—137 **8 Claims**



1. In a textile machine such as a ring spinning machine or the like having a row of spindles, a plurality of ring rail supports and a ring rail, the ring rail including a plurality of aligned elongate ring rail segments, each ring rail segment carrying a plurality of rings, each ring being associated with a spindle and having a traveler for guiding yarn onto its associated spindle, and each ring rail support being vertically movable along a respective vertical guide, an apparatus for maintaining a ring rail segment at a predetermined position with respect to the spindles serviced by its rings, said apparatus comprising:

a centering projection mounted on a selected one of the segment and one of its ring rail supports;

a centering bore formed in the other of the segment and said one ring rail support, said centering bore being disposed at the intersection of a longitudinal axis generally parallel to the longitudinal edge of the segment and a lateral axis

generally perpendicular to the longitudinal axis and generally parallel to the lateral edge of the segment, said centering bore being compatible configured with respect to said centering projection to relatively snugly receive said centering projection;

a lateral guide projection mounted on a selected one of the segment and one of the ring rail supports;

a lateral guide bore, formed in the other of the segment and said one ring rail support associated with said lateral guide projection, for receiving said lateral guide projection therein, said lateral guide bore having a cross-sectional extent longitudinally with respect to said segment and a transverse cross-sectional extent laterally with respect to said segment, said longitudinal extent of said lateral guide bore corresponding to a cross-sectional extent of said lateral guide projection longitudinally with respect to said segment such that said lateral guide projection is relatively snugly received therein and said lateral extent of said lateral guide bore being sufficiently greater than a cross-sectional extent of said lateral guide projection laterally with respect to said segment that said lateral guide projection is slidably movable along said lateral extent of said lateral guide bore, said lateral guide bore being located with its lateral extent generally aligned with said lateral axis through said centering bore;

a longitudinal guide projection mounted on a selected one of the segment and the ring rail support other than said ring rail support associated with said lateral guide bore and projections; and

a longitudinal guide bore, formed in the other of the segment and said other ring support, for receiving said longitudinal guide projection therein, said longitudinal guide bore having a cross-sectional extent laterally with respect to said segment and a transverse cross-sectional extent longitudinally with respect to said segment, said lateral extent of said longitudinal guide bore corresponding to a cross-sectional extent of said longitudinal guide projection laterally with respect to said segment such that said longitudinal guide projection is relatively snugly received therein, and said longitudinal extent of said longitudinal guide bore being sufficiently greater than a cross-sectional extent of said longitudinal guide projection longitudinally with respect to said segment that said longitudinal guide projection is slidably movable along said longitudinal extent of said longitudinal guide bore, said longitudinal guide bore being located with its longitudinal extent generally aligned with said longitudinal axis through said centering bore, whereby the segment is maintained at a predetermined position with respect to the spindles serviced by its rings while variations in its longitudinal and lateral extent which may occur due to temperature changes or the like are automatically accommodated.

4,879,873

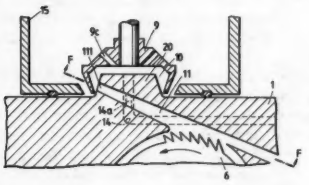
SPINNING UNIT IN OPEN-END SPINNING MACHINE

Susumu Kawabata; Tetsuzo Inoue, and Hiroshi Niimi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jul. 29, 1988, Ser. No. 225,735
Claims priority, application Japan, Jul. 31, 1987, 62-93065
Int. Cl.[4] D01H 7/892, 7/882
U.S. Cl. 57—413 **7 Claims**

1. A spinning unit of an open-end spinning machine comprising:

a rotor having an inner wall, a bottom portion and an open end opposite to said bottom portion and being arranged to rotate about a center axis perpendicular to said bottom portion; and a stationary closing member projecting into a spinning chamber of said rotor to extend over the rotational axis of the rotor and thereby close the open end of said rotor and being provided with a fiber supply duct which opens toward said inner wall of said rotor, said fiber supply duct having one side wall located at one side of said closing member and an opposite side wall located at an opposite side of said closing member and a yarn guide hole which opens at an end surface thereof opposite said bottom portion of said rotor; wherein said fiber supply duct is arranged in said closing member so that the diameter of said fiber supply duct is not larger than 90 percent of the diameter of said closing member.

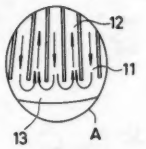


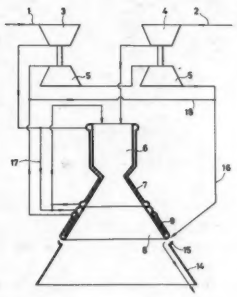
4,879,874

LIQUID FUEL ROCKET ENGINE

Yukio Koyari; Eiji Sogame, both of Tokyo; Kanji Kishimoto, and Yojiro Kakuma, both of Aichi Pref., all of Japan, assignors to National Space Development Agency of Japan, Tokyo, Japan

Continuation-in-part of Ser. No. 47,163, May 6, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,938
Claims priority, application Japan, May 7, 1986, 61-104481
Int. Cl.[4] F02K 9/46
U.S. Cl. 60—259 **3 Claims**





1. A liquid fuel rocket engine having a fuel booster means (3) for boosting the pressure of fuel component, an oxidizer booster means (4) for boosting the pressure of oxidizer component, two booster driving means for energizing said two booster means, a combustor means (6) wherein said booster fuel and oxidizer components are put into combustion to produce a combustion gas to be discharged outwardly, a combustor cooling jacket means (7) mounted operatively around the circumference of said combustor means, a high expansion nozzle means (8) extending from said combustor means (6), and an expansion nozzle cooling jacket means (9) disposed operatively around the circumference of said high expansion nozzle means (8), said engine having an outlet from said fuel booster

means (3) connected operatively to an inlet to said combustor cooling jacket means (7), having an outlet from said combustor cooling jacket means (7) connected operatively to a fuel inlet to said combustor means (6) and to an inlet to said expansion nozzle cooling jacket means (9), and having an outlet from said expansion nozzle cooling jacket means (9) connected operatively to an inlet to said two booster driving means (5), respectively;

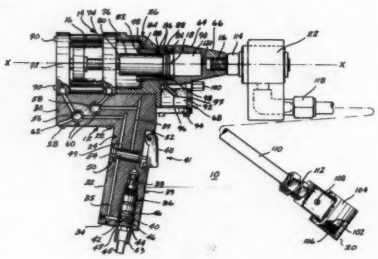
said engine is characterized in that said expansion nozzle cooling jacket means (9) comprises an alternating arrangement of upflow and downflow tube means (11, 12) along the surface of said high expansion nozzle means (8), said upflow and downflow tube means being connected to each other at their downstream ends (13), said outlet from said combustor cooling jacket means (7) being connected to the downflow tube means (11), and outlets from said upflow tube means (12) being connected to an inlet to one of said booster driving means (5), said engine being further characterized in that a non-cooled nozzle extension means (14) is disposed in the downstream position from said expansion nozzle cooling jacket means (9) and a turbine exhaust gas manifold means (15) is disposed in said non-cooled nozzle extension means (14), said turbine exhaust gas manifold means (15) being connected to one of said booster driving means (5) through a turbine exhaust gas duct means (16).

4,879,875

FASTENER DRIVING TOOL

Edward J. Davert, Seattle, and Peter D. McCowin, Enumclaw, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 22, 1988, Ser. No. 171,752
Int. Cl.[4] F15B 7/08
U.S. Cl. 60—588 **11 Claims**



1. A fastener driving tool for inserting remotely located fasteners into a preformed opening in a structure, comprising:

a housing;

a hydraulic pressure generating means located within said housing for generating hydraulic pressure;

a hydraulic cylinder means remotely located from said housing and having a hydraulic piston in fluid communication with said hydraulic pressure generating means, said hydraulic piston being mounted within said hydraulic cylinder means for movement between a retracted position and an extended position, such that upon activation of said hydraulic pressure generation means said hydraulic piston is extended to thereby insert at least one fastener through the preformed opening; and

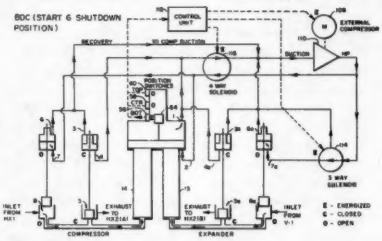
a hydraulic fluid reservoir located within said housing, said hydraulic fluid reservoir being in fluid communication with said hydraulic cylinder means only when said hydraulic pressure generating means is not generating pressure, such that fluid is directed from said reservoir to said hydraulic cylinder means to thereby replenish lost fluid in said hydraulic cylinder means.

4,879,876

CRYOGENIC REFRIGERATION APPARATUS

Warren A. Robertson, 8021 Floral View Way, Port Richey, Fla. 34668

Filed Feb. 3, 1989, Ser. No. 305,569
Int. Cl.[4] F25B 9/00
U.S. Cl. 62—6 **20 Claims**



1. A cryogenic refrigeration apparatus, comprising:

a compressor piston and cylinder;

an expander piston and cylinder;

a driver piston and cylinder that yokes together said compressor and expander pistons;

a position cylinder;

a first, second and third switch means positioned in specifically predetermined respective positions along the longitudinal extent of said position cylinder;

a magnet means slideably disposed within said position cylinder;

an elongate rod means interconnecting said magnet means and said driver piston so that reciprocation of said driver piston effects simultaneous and corresponding reciprocation of said magnet means within said position cylinder;

said magnet means being operative to activate, in sequence, said first, second and third switch means as said magnet means reciprocates within said position cylinder in driven relation to said driver piston;

said compressor cylinder having an inlet valve and an exhaust valve, both of which valves are confluent with a common compresor cylinder head;

said expander cylinder having an inlet valve and an exhaust valve, both of which valves are confluent with a common expander cylinder head;

means for selectively opening and closing said inlet and exhaust valves;

a logic control unit conductively coupled to said first, second and third switch means;

said means for selectively opening and closing said inlets and exhaust valves being coupled in driven relation to said logic control unit so that said logic control unit determines the opening and closing of said inlet and exhaust valves based upon the position of said driver piston;

a first heat exchanger means having a first inlet confluent with boiled off cryogenic gases from a load and having a first outlet confluent with said compressor cylinder inlet valve;

a second heat exchanger means having a first inlet confluent with said compressor cylinder exhaust valve and a second inlet confluent with said expander cylinder exhaust valve;

said expander cylinder inlet valve being confluent with said compressor cylinder exhaust valve; and

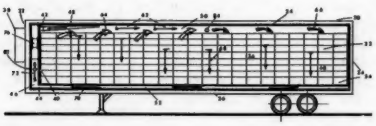
a motor driven external compressor means for driving said driver piston.

4,879,877

AIR CONDITIONING METHOD AND APPARATUS FOR REFRIGERATED VEHICLES

Gerald E. Hicke, 2468 Kingfield Way, San Jose, Calif. 95124

Filed Jul. 21, 1988, Ser. No. 222,165
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—89 15 Claims



1. A refrigeration system for a vehicle with an elongated cargo containing space formed by a roof, floor, side walls and front and rear end walls, the refrigeration system being associated with a refrigeration or heating and cooling unit mounted at one end of the cargo containing space and comprising

means for isolating the refrigeration unit from the cargo containing space, the refrigeration unit having an outlet in communication with the cargo containing space adjacent its roof and an inlet in communication with the cargo containing space adjacent its floor,

a supply duct formed along the top of the cargo containing space adjacent the roof and in communication with the outlet,

a return duct formed substantially along the length of the cargo containing space by the floor and in communication with the inlet,

means for communicating gas or air from the supply duct to the return duct through and around cargo in the cargo containing space,

control means arranged along the length of the cargo containing space for regulating gas or air flow into the return duct to form a generally uniform pressure differential between the cargo containing space and the return duct in order to achieve more uniform cooling throughout the cargo containing space, and

the means for communicating gas or air from the supply duct to the return duct comprising heat barrier/spacer means arranged on vertical surfaces of the cargo containing space for allowing refrigerated gas air from the supply duct adjacent the roof toward the return duct adjacent the floor to prevent or minimize heat passage from the vertical surfaces to the cargo space.

4,879,878

AIR DAMPER ASSEMBLY FOR REFRIGERATOR/FREEZER

John Polkinghorne, Burlington, Canada, assignor to TRW Canada, Ltd., Stoney Creek, Canada

Division of Ser. No. 89,026, Jul. 24, 1987, Pat. No. 4,843,833, which is a continuation of Ser. No. 708,918, Mar. 6, 1985, abandoned. This application Apr. 15, 1988, Ser. No. 182,306
Claims priority, application Canada, Mar. 6, 1984, 448959
Int. Cl.[4] F25D *17/04*
U.S. Cl. 62—187 9 Claims

1. A refrigeration apparatus comprising:

a freezer compartment;

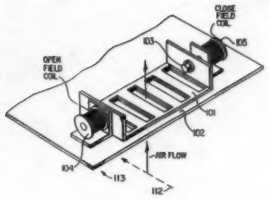
a fresh food compartment;

a cooling means for at least cooling the freezer compartment to subfreezing temperatures;

an air damper apparatus disposed in a fluid communication passage between the food compartment and at least one of the freezer compartment and the cooling means for selectively channeling cold air into the food compartment, the air damper apparatus including:

a slidably mounted damper door which is slidable between a first position in which cold air communication with the food compartment is at least partially blocked and a second position in which cold air is at least partially permitted to flow into the food compartment, the damper door being mounted such that it is gravitationally biased to remain in the selected one of the first and second positions until it receives a positive moving force;

a first and second oppositely acting electromagnetic means for selectively moving the damper door between the first and second positions in response to short, intermittently applied and separately controlled first and second electrical pulses, respectively, such that the damper door is moved to a selected one of the first and second positions



by separate momentary first and second electrical pulse and is gravitationally biased in said selected position without a continuous expenditure of electrical energy;

an open loop temperature controlling means for controlling the cooling means and for controlling the first and second electromagnetic means to maintain the freezer and food compartments generally at preselected temperatures; and,

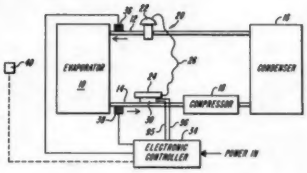
a periodic refreshing means for periodically repeating the first and second pulses such that the first and second electromagnetic means are refreshed to assure retention in the selected position.

4,879,879

APPARATUS FOR CONTROLLING A THERMOSTATIC EXPANSION VALVE

Joseph Marsala, 711 Wellman Ave., North Chelmsford, Mass. 01863, and Melvin M. Winters, 2028 Rocky Weed Rd., Berrien Springs, Mich. 49103

Filed Oct. 5, 1988, Ser. No. 253,715
Int. Cl.[4] G05D *23/30, 15/00*
U.S. Cl. 62—202 27 Claims



1. Apparatus for controlling a heating or cooling system of the type including an evaporator having an inlet line and a suction line, and a thermostatic expansion valve for controlling flow of refrigerant into the evaporator, said thermostatic expansion valve including a valve in said inlet line and a thermostatic bulb coupled to said valve, said apparatus comprising:

a thermoelectric heat pump device responsive to an electrical control signal for controlling transfer of thermal energy to and from said thermostatic bulb, said thermoelectric device being positioned between said thermostatic bulb and said suction line, and being in thermal contact with said thermostatic bulb and said suction line;

means for sensing at least one temperature associated with said heating or cooling system; and

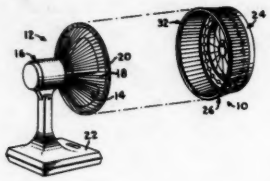
electronic control means responsive to the sensed temperature for providing said electrical control signal to said thermoelectric device for maintaining a desired operating condition of said evaporator.

4,879,880

AIR TEMPERATURE REGULATOR

Frank Harrison, P.O. Box 1824, Kansas City, Mo. 64141

Filed Jan. 17, 1989, Ser. No. 297,102
Int. Cl.[4] F25D *17/04*
U.S. Cl. 62—406 10 Claims



1. A temperature controlling apparatus for attachment to a fan having rotatable propeller for generating an air stream, said apparatus comprising:

a plurality of individual cells containing a phase-change material therein; and

a housing adapted for mounting to said fan, said housing including means for releasably securing said cells in said airstream and having motive means for selectively releasing said cells from said securing means in said housing,

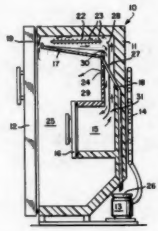
said individual cells being arrayed peripherally in said airstream and defining an annular, substantially uninterrupted airway between said cells and said motive means.

4,879,881

ENERGY EFFICIENT FROST-FREE REFRIGERATOR

Stephen M. Madigan, 10 Crestmont Rd., Montclair, N.J. 07042

Filed Sep. 19, 1988, Ser. No. 246,151
Int. Cl.[4] F25D *11/02*
U.S. Cl. 62—447 43 Claims



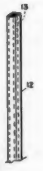
43. An energy efficient frost free refrigerator including a freezing compartment and a cooling compartment, a single refrigerating element, temperature control means, said temperature control means adapted to actuate said refrigerating element to on and off cycles at selected temperatures, said refrigerating element located above said freezing compartment, means to direct air from said refrigerating element to said freezing compartment, means to direct air from said refrigerating element to said cooling compartment, means to direct air from said freezing compartment to said refrigerating element, means to direct air from said cooling compartment to said refrigerating element, said means to direct air from said refrigerating element to said freezing compartment and from said refrigerating element to said cooling compartment and from said freezing compartment to said refrigerating element include a channel between said refrigerating element and said freezing compartment, said channel including a plurality of passages, said passages defined by a shield, said shield ending within said freezing compartment, said shield curved at its end, at least one said passage adapted to direct air from said refrigerating element to said freezing compartment and at least one passage adapted to direct air from said freezing compartment to said refrigerating element, and said at least one passage from said freezing compartment to said refrigerating element openly at a level above said at least one passage from said refrigerating element to said freezing compartment.

4,879,882

JEWELRY WITH INTERCHANGEABLE ELEMENTS

Robert P. Johnson, and Janice A. Johnson, both of Glendale, Ariz., assignors to RPJ Development Corporation, Phoenix, Ariz.

Filed Aug. 15, 1988, Ser. No. 232,109
Int. Cl.[4] A44C *5/02*
U.S. Cl. 63—4 18 Claims



1. A jewelry pendant having interchangeable decorative elements comprising:

a vertical stem portion having a noncircular cross section, an upper end and a lower end, said upper end including a loop having a gap therein;

a plurality of beads, each having at least one flat face and an opening therethrough of said noncircular cross section to permit threading said beads on said stem portion in which an uppermost one of said beds serves to close said gap of said loop; and

clutch removably attachable to said lower end means for selectively retaining said beads on said stem portion.

4,879,883

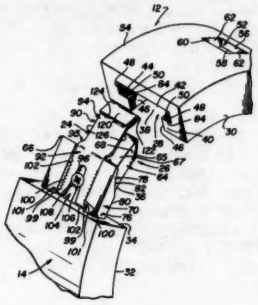
OPENABLE RING WITH UNIQUE LOCKING AND RELEASE MEANS

Mates A. Bruner, 14 Barbara La., Havertown, Pa. 19083

Filed Aug. 9, 1988, Ser. No. 230,285
Int. Cl.[4] A44C *5/00*
U.S. Cl. 63—15.7 8 Claims

1. A ring to be worn as an article of jewelry about a portion of a body of a person, said ring comprising: a first rigid arcuate section having an arcuate inner surface, a substantially T-shaped recess in said first arcuate section extending along a portion of the arc of said first arcuate section and having an outer head portion of a wider transverse dimension than an inner stem portion, said head portion and stem portion being joined through upwardly facing, transversely extending support surfaces forming part of said recess, said recess having an open free end with the inner stem portion of said recess including an opening along said arcuate inner surface for communicating with the interior of the ring, said first arcuate section

including an access aperture extending through an outer surface adjacent a rear end of the substantially T-shaped recess and communicating with the outer head portion of said T-shaped recess; a second rigid arcuate section pivotably connected to said first arcuate section and having an inner surface and a rigid male extending member projecting therefrom, said male extending member including a distal portion having a transverse dimension receiveable within the stem portion of the recess through both the open free end of said recess and the opening along said arcuate inner surface of said recess, said male extending member further including a proximal portion having a substantially T-shaped transverse configuration including downwardly extending surfaces overlying the transversely extending support surfaces of the T-shaped recess



when said arcuate sections are in a fully closed position, and latching means for maintaining the male extending member in a position fully inserted within said recess when the arcuate sections are in a fully closed position, said latching means including a spring element having a rear end attached to the male extending member and a forward locking section having a locking edge normally disposed within the access aperture when the arcuate sections are in a closed position to thereby maintain said arcuate sections in said closed position, a rear surface of said T-shaped recess being inclined and engageable by a surface of the spring element when the section of said spring element located in the access aperture is biased inwardly out of alignment with the access aperture to thereby provide a force between the arcuate sections in a direction for opening said arcuate sections.

4,879,884

UNIVERSAL DOUBLE-CYLINDER, MULTI-YARN-FEED CIRCULAR KNITTING MACHINE

Leopoldo Bertagnoli, Brescia, Italy, assignor to Orizio Paolo S.p.A., Brescia, Italy

Filed Jan. 26, 1988, Ser. No. 148,648

Claims priority, application Italy, Feb. 2, 1987, 19226 A/87

Int. Cl.[4] D04B *9/10, 15/32, 15/78*

U.S. Cl. 66—14 **4 Claims**

1. A circular knitting machine equipped with a plurality of knitting stations, the knitting machine comprising:

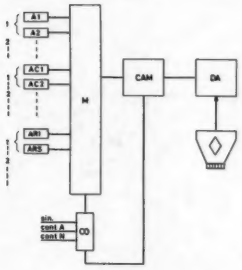
two coaxially superposed rotatable needle cylinders, each of said cylinders having a plurality of peripheral vertical aligned slots, each of said slots of the lower cylinder having inserted therein a selector element, a needle pusher and a lower slider, an upper slider being inserted in each of said slots of the upper cylinder, a plurality of double-ended needles transferrable between said slots of the lower and upper cylinders being provided for the manufacture of fabrics having rib and plain stitches;

a stationary lower cambox having a plurality of radially fixed cams for cooperating with butts of said selector elements, needle pushers and lower sliders, said lower cambox surrounding said revolving lower cylinder;

a stationary upper cambox having a plurality of radially fixed cams and two radially movable cams for cooperating with butts of said upper sliders, said upper cambox surrounding said revolving upper cylinder;

first and second groups of electromechanical selection actuators each having a movable selection means for engaging the butts of said selector elements in each of said knitting stations, each of said groups of electromechanical selection actuators being preceded in the direction of cylinder revolution by a stationary extraction cam actuable with said selector elements, an electromechanical cam actuator being associated with each of said radially movable cams of said upper cambox for moving the corresponding cam between an operative position, in which the cam is engaged with the butts of the upper sliders, and an inoperative position;

a plurality of regulating devices for regulating the length of the rib and plain stitches formed in each knitting station, said regulating devices being electromechanically driven by means of individual regulating electromechanical actuators;



a plurality of lower and upper presses provided with undercuts for acting on corresponding ones of said lower and upper sliders and for allowing said double-ended needles to be transferred between said cylinders; and

a central electronic control unit for sending actuation signals to said electromechanical cam actuators, said electromechanical selection actuators and said regulating electromechanical actuators, said control unit comprising processing means, a pattern analyzer, and an encoder which supplies synchronization signals, a needle counting signal for each cylinder revolution and cylinder revolution counting signals to said processing means, in accordance with rotational movement of said needle cylinders, whereby said processing means emits said actuation signals to said electromechanical cam actuators, said selection actuators and said regulating electromechanical actuators in response to signal input received from said pattern analyzer and from said encoder.

4,879,885

KNITTING MACHINE HAVING RELATIVELY ADJUSTABLE NEEDLE CAMS AND SINKER CAMS

Falk Kühn, Rottenburg, Fed. Rep. of Germany, assignor to Memminger GmbH, Freudenstadt, Fed. Rep. of Germany

Filed May 4, 1988, Ser. No. 190,033

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716711

Int. Cl.[4] D04B *15/24, 15/32*

U.S. Cl. 66—54 **11 Claims**

1. Knitting machine having

a frame (6);

a needle bed (1, 3);

knitting needles (4, 5) located on the needle bed;

sinkers (22) which are short with respect to the needles located between the needle bed;

needle cam means (14) having a needle cam control track (20) operatively coupled to the needles to move the needles between a projected position and a withdrawn position and defining an upper needle motion reversal position (45) and a lower needle motion reversal position (46);

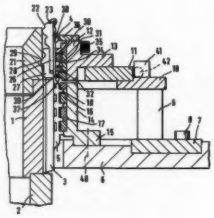
sinker cam means (12) having a sinker cam control track (33) operatively coupled to the sinkers to move the sinkers between a projected position and a withdrawn position and defining an upper sinker motion reversal position (49) and a lower sinker motion reversal position (48), said sinkers being additionally movable in a direction transverse to the longitudinal extent of the needle;

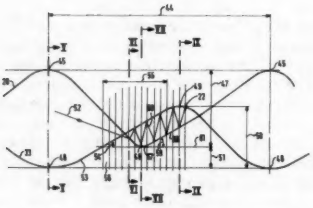
adjustment means (35) adjustably securing the sinker cam means (12) relative to the needle cam means (14) and securing the sinker cam means to the machine frame;

and wherein

the needle cam control track (20) is positioned with respect to the sinker cam control track (33) such that

a first range of movement of the needles (4) and sinkers (22) is controlled to move the needles in a direction downwardly towards the lowest withdrawn and needle reversal position (46) and counter to the direction of concurrent movement of the sinkers, and determining the length of loop stitches;





then, a second range of movement of the needles and sinkers is controlled from the position in which the needles (4) are at the lowest withdrawn, or needle movement reversal position (46) of the needle cam track and the sinker cam track has a portion which controls the sinkers for projecting movement;

a third range movement of the needles and the sinkers is controlled, in which the needles (4) and sinkers (22) move in the same direction,

wherein, for said third range of movement,

the needle cam control track (20), subsequent to said needle movement reversal position, a rising section which rising section has an essentially straight portion (58) and

the sinker cam control track (33) has a rising section which has an essentially straight portion (55),

which sinker cam control track (33) in the region of the essentially straight portion (55) thereof is essentially parallel to the essentially straight rising portion (58) of the needle cam control track (20);

wherein said adjustment means permit selective relative positioning of the needle cam means (14) and the sinker cam means (12) to position the needle cam control track (20) and the sinker cam control track (33) to place the lower needle reversal position (45) of the needle cam control track (20) to always remain in alignment with the essentially straight rising portion (55) of the sinker cam control track (33), and upon change of such selective relative positioning, maintaining intact said essentially parallel relationship of the essentially straight rising portions (58, 55) of the needle cam control track and the sinker cam control track; and

wherein the essentially straight portions (58, 55) of the needle and sinker cam control tracks (22, 23) have projection angles (59, 54) which are essentially constant throughout essentially the respective essentially straight portions of said control tracks.

4,879,886

CIRCULAR KNITTING MACHINE

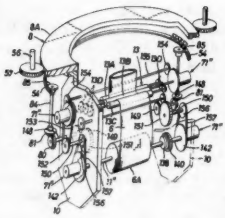
Toshihiko Okada; Toshifumi Yagi, and Satoshi Suzuki, all of Kyoto, Japan, assignors to Gunze Limited, Ayabe, Japan

Filed Apr. 27, 1988, Ser. No. 186,636

Claims priority, application Japan, May 1, 1987, 62-109554; Jul. 17, 1987, 62-110140[U]; Aug. 4, 1987, 62-195039; Oct. 19, 1987, 62-160576[U]

Int. Cl.[4] D04B *15/88*

U.S. Cl. 66—151 **17 Claims**



1. A circular knitting machine including rotatable knitting means for forming a tubular knitted fabric; fabric transport means comprising a plurality of rollers for delivering knitted fabric in a hanging state from the knitting means; take-up spool means for rolling up the knitted fabric delivered in a hanging state by the transport means; a pair of opposed take-up frames which are stoppably rotated in synchronism with the knitting means by a drive transmission that is provided at an upper location of the take-up frame and includes a ring gear that is in engagement with a pinion gear; wherein, between the pair of the frames and at an upper location of the frames, the rollers of the fabric transport means are horizontally carried in parallel under the ring gear; and at a lower location of the frames, the take-up spool means is arranged parallel to the rollers of the fabric transport means; said knitting machine further comprising:

a constant-torque transmission means for magnetically transmitting a constant-torque, wherein the constant-torque transmission means comprises a drive ring, a driven ring, and a magnetic slip coupling for transferring rotation of the drive ring to the driven ring due to torque generated by a magnetic interaction between the drive ring and the driven ring which occurs upon rotation of the drive ring and which produces a constant-torque by enabling slippage between the rings when a load over a certain limit is applied to the slip coupling; wherein a mechanical transmission means is provided for rotating the drive ring of the constant-torque transmission means by force derived

from rotation of the frames by the engagement between the pinion gear and the ring gear; and wherein said driven ring is coupled to the rollers of the fabric transport means.

4,879,887

CONTINUOUS FLOW WASHING MACHINE

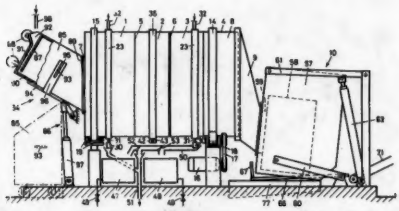
Rudolf Kägi, Hadlikon-Hinwil, and Eugen Baumgartner, Wolfhausen, both of Switzerland, assignors to Maschinenfabrik Ad. Schulthess & Co. AG, Zurich, Switzerland

Filed Mar. 25, 1988, Ser. No. 173,054

Claims priority, application Switzerland, Mar. 27, 1987, 1177/87

Int. Cl.[4] D06F *31/00*

U.S. Cl. 68—16 8 Claims



1. Continuous flow washing machine comprising a tube (4) containing a single prewash chamber (1), a single clear wash chamber (2) and a single rinse chamber (3), wherein the prewash chamber (1) includes a first sluice gate (23), the clear wash chamber (2) includes a second sluice gate (36), and the rinse chamber (3) includes the third sluice gate (23), wherein means (43) are provided for heating clear wash water in the clear wash chamber (2) through the second sluice gate (36), wherein the prewash chamber (1) is selectively drained into a drain through the first sluice gate (23), wherein the rinse chamber (3) is drained selectively through the third sluice gate (23) into either a tank (47) comprising means for heating water in the tank or into an additional water receiving unit (48, 51) and is filled by means of a supply member (32), and wherein the prewash chamber (1) is selectively filled from the tank (47).

4,879,888

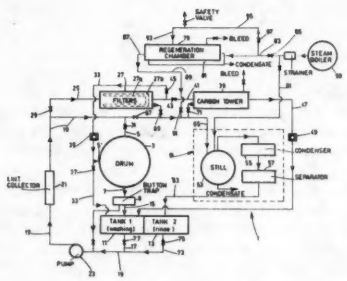
DRY CLEANING MACHINE

Moshe Suissa, 5561 Alpine, Côte St Luc, Quebec, Canada (H4V 2X4)

Filed Dec. 12, 1988, Ser. No. 282,499

Int. Cl.[4] D06F *43/08*

U.S. Cl. 68—18 C 14 Claims



1. In a dry cleaning machine of the type comprising:

a rotating drum in which the laundry to be cleaned is treated with a cleaning solvent, said drum having a solvent inlet and a solvent outlet;

at least one storage tank for the solvent, said at least one tank having a solvent inlet and a solvent outlet;

a solvent feed line extending from the outlet of said at least one storage tank to the inlet of the drum, said feed line including a lint collector;

a pump for circulating the solvent from said at least one tank to the drum through the feed line;

a solvent return line extending from the outlet of the drum to the inlet of said at least one storage tank, said return line including a button trap,

a solvent filtration unit including at least one filter and means for allowing at least part of the solvent circulating through the feed line downstream the lint collector to pass through said at least one filter;

a solvent decoloration unit including a bed of activated carbon and means for allowing at least part of the solvent having passed through said at least one filter to pass through said at least one filter to pass through said carbon bed; and

a solvent distillation unit including a still, a condenser, a separator and means for allowing at least part of the solvent having passed through at least the lint collector to be fed into the still and distilled therein, then condensed in the condenser and finally returned to said at least one storage tank via the separator and a return pipe;

the improvement wherein the machine further comprises:

a regeneration unit to reactivate the carbon used in the carbon tower whenever necessary, said regeneration unit comprising:

a chamber in which the carbon to be reactivated is introduced and processed;

means for heating the chamber to evaporate the solvent dripping from the carbon to be reactivated and subsequently drying said carbon after the regeneration process has been completed,

means for injecting live steam into the heated chamber to desorb the carbon to be reactivated; and

piping means to direct the evaporated solvent and desorbsion steam from the heated chamber to the still of the solvent distillation unit.

4,879,889

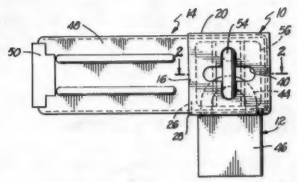
SHACKLE PROTECTOR

DeForrest, Sr., William, 1825 Via Burton, Anaheim, Calif. 92806

Continuation-in-part of Ser. No. 79,346, Jul. 30, 1987, Pat. No. 4,852,920. This application Sep. 28, 1987, Ser. No. 101,685

Int. Cl.[4] E05B *67/38*

U.S. Cl. 70—56 5 Claims



1. In combination with a hasp having a slot for receiving a staple and a padlock having a shackle, a separate shackle protector which comprises:

a first plate, said first plate shaped as a quadrilateral;

a second plate, said second plate shaped as a quadrilateral;

a first wall joining said first and said second plates along the length of an edge of each of said first and second plates and positioning and fixedly holding said first and said second plates in a parallel-planar relationship with a hollow interior between said first and second plates;

a further wall joining at least a portion of a further edge of each of said first and said second plates, said further wall perpendicular to said first wall;

a first elongated slot of a width and a length sufficiently greater than the dimensions of said staple of said hasp to allow said staple to be inserted through said first elongated slot, said first slot located in said first plate;

a second elongated slot of a width and a length sufficiently greater than the dimensions of said staple of said hasp to allow said staple to be inserted through said second elongated slot, said second slot located in said second plate; and

said shackle protector positionable over said staple of said hasp by inserting said staple of said hasp through at least one of said first or said second slots with said shackle protector secured to said staple of said hasp and protecting said padlock shackle by positioning said padlock shackle in said hollow interior between said first and said second plates with said shackle passing through said staple of said hasp.

4,879,890

EXPLOSIVE EXPANSION OF METAL TUBES

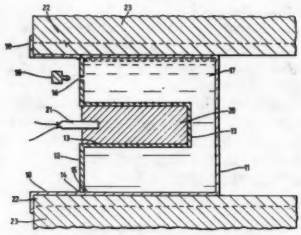
Roy Hardwick, Troon, Scotland, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 2, 1988, Ser. No. 242,809

Claims priority, application United Kingdom, Sep. 18, 1987, 8721985

Int. Cl.[4] B21D *26/08*

U.S. Cl. 72—62 **11 Claims**



1. A shock wave-transmitting insert for holding an explosive charge axially within a tubular metal element to be expanded and to transmit the shock wave from the said charge to the said tubular metal element when the charge is fired, characterised in that

the said insert comprises a hollow cylindrical container and charge-holding means to accommodate an explosive charge and locate it axially within the container, said container being adapted in use to be filled with a shock wave-transmitting liquid.

4,879,891

METHOD OF MANUFACTURING HEAT SINK APPARATUS

Howard G. Hinshaw, Dallas, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

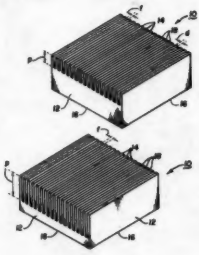
Division of Ser. No. 262,695, Oct. 26, 1988, which is a continuation of Ser. No. 42,706, Apr. 27, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,484

Int. Cl.[4] B21C *23/00*

U.S. Cl. 72—254 **5 Claims**

1. The method of forming a unitary heat sink metal body for use in removal of heat from a heat generating electronic device package comprising the steps of:

(a) extruding a unitary metal body of heat conducting material having a base surface on a first side thereof adapted to be positioned in thermally conductive contact with a heat generating electronic device package, said body including a predetermined number of parallel fins extending outwardly a first predetermined height from a side opposite said base surface, said predetermined number of parallel fins separated by a first predetermined number of parallel grooves of a first predetermined width and a first predetermined depth with the ratio of said first predetermined height to said first predetermined width being at least four to one; and



(b) sawing the first predetermined number of parallel grooves to a second predetermined depth to provide a second predetermined height to said parallel fins, whereby the ratio of the second predetermined height of said predetermined number of parallel fins to the first predetermined width of said first predetermined number of parallel grooves is at least six to one.

4,879,892

DRAWING MACHINE FOR CONTINUOUS DRAWING OF ENDLESS WIRES OR TUBES

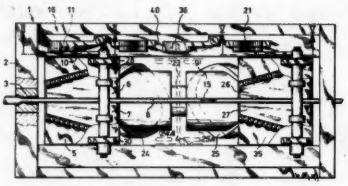
Elefterios Paraskevas, Aachen, Fed. Rep. of Germany, assignor to Kiehmaschinen GmbH, Solingen, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,426

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1987, 3729892

Int. Cl.[4] B21C *1/28*

U.S. Cl. 72—290 **10 Claims**



1. A continuous drawing machine for longitudinally drawing a workpiece comprising: a machine frame with a drawing die mounted thereon, two drawing carriages and drive means for axial displacement thereof; an arm projecting from each carriage; guideways on said machine frame for said drawing carriages on which each of said carriages is movably mounted; at least one pair of clamping jaws on each drawing carriage, the clamping jaws being displaceable towards the workpiece by means of said arm; a first cam curve mounted on said machine frame; the arm cooperating with the machine frame by means of said first cam curve located next to the starting position of working stroke of the carriage; and a second arm curve mounted on said machine frame, said first and second cam curves being separate from said drive means, said second cam

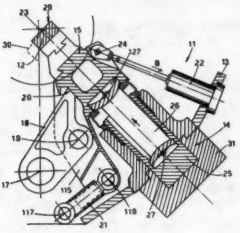
curve cooperating with the arm at the end of the return stroke; the arm actuating the clamping jaws to clamp said workpiece upon cooperation with the first cam curve.

4,879,893

MULTIPURPOSE SWAGING MACHINE

Antonino Duri' , Pradamano, and Geremia Nonini, Buttrio, both of Italy, assignors to Danieli & C. Officine Mecchaniche SpA, Nazionale, Italy

Filed Jun. 17, 1988, Ser. No. 208,043
Claims priority, application Italy, Jul. 3, 1987, 83399 A/87
Int. Cl.[4] B21J *7/14*
U.S. Cl. 72—402 **4 Claims**



1. Multipurpose swaging machine comprising a hammer assembly and a return jack for repositioning the hammer assembly, wherein the hammer assembly includes a hammer support element, a power ram and a hammer, the improvement comprising:

(a) a first lever rotatably fixed to a side of the hammer support element, and

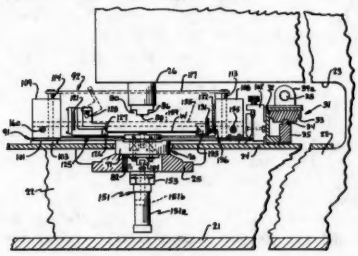
(b) an extendable first jack rotatably fitted to the same side of the hammer support element as the first lever, wherein the first jack, in an unextended position, forms a parallelogram with the first lever such that the first jack and first lever act to impart linear movement to the hammer assembly, and the first jack, in an extended position, acts with the first lever to impart hammer assembly movement along an arc of a circle.

4,879,894

PRESS WITH MOVABLE WORKPIECE SUPPORT CARRIER

Roger J. Benedict, and John K. Forlow, both of Rockford, Ill., assignors to Roper Whitney Company, Rockford, Ill.

Filed Jun. 6, 1988, Ser. No. 202,934
Int. Cl.[4] B21J *13/08, 13/16;* B21D *28/26*
U.S. Cl. 72—405 **26 Claims**



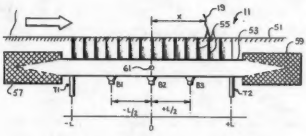
1. A press for performing successive forming operations on different areas of a workpiece having upper and lower sides, the press including stationary frame means having a work station, lower press tool means mounted on the stationary frame means below the work station, ram means mounted on the frame means above the work station and operable through a cycle having a downward punch stroke and an upward return stroke, upper press tool means mounted on the ram means, workpiece carrier means mounted for movement in a generally horizontal plane relative to the stationary frame means, workpiece support means mounted on the carrier means for movement horizontally therewith and for limited vertical movement relative thereto, means for moving the carrier means in said generally horizontal plane to position different areas of the workpiece at the work station, the upper press tool means being operative when the ram means is moved in said downward stroke to press the workpiece downwardly, and operating means for moving the workpiece support means downwardly relative to the carrier means during movement of the ram means in said downward stroke and for moving the workpiece support means upwardly relative to the carrier means during movement of the ram means in said upward return stroke, said means for moving said carrier means in a generally horizontal plane including means for moving the carrier means along a generally horizontal X-axis and means for moving the carrier means along a generally horizontal Y-axis transverse to said X-axis.

4,879,895

NORMAL SHOCK LOCATOR

Miklos Sajben, Chesterfield, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 29, 1988, Ser. No. 237,073
Int. Cl.[4] G01L *27/00*
U.S. Cl. 73—4 R **21 Claims**



1. A shock position indicating apparatus comprising:

inlet means for containing the said shock to be measured;

multiplicity of tube means, opening into said inlet means, for providing pressure communication with said inlet means;

cavity means for receiving pressure fluctuations, connected to said multiplicity of tube means;

pressure transduction means, located near the ends of said cavity means, for sensing pressure fluctuations in said cavity means; and,

tone means, adjacent said cavity means, for producing an acoustic tone within said cavity means.

4,879,896

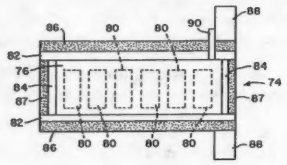
METHOD AND APPARATUS FOR LEAK TESTING OF PIPE

Ronnie F. Miller, 1600 Chantilly St.; Arthur L. Dwyer, 101 Sapen Dr.; Darwin A. Miller, P.O. Box 1267, and Darwin L. Miller, 200 Bubby Dr., all of Houma, La. 70360

Continuation of Ser. No. 868,009, May 29, 1986, Pat. No. 4,727,749, which is a division of Ser. No. 571,823, Jan. 18, 1984, Pat. No. 4,601,194, which is a continuation-in-part of Ser. No. 458,790, Jan. 18, 1983, abandoned. This application Aug. 19, 1987, Ser. No. 86,792
The portion of the term of this patent subsequent to Mar. 1, 2006, has been disclaimed.
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—46 **12 Claims**

1. An enclosure for containing a test gas adjacent a test area in a fluid carrying system, said enclosure comprising:

(a) a unitary, substantially gas impermeable flexible body positionable about a fluid conduit having a longitudinal axis in overlying relationship with a test area, said flexible body including a unitary joint extending substantially longitudinally in the direction of the longitudinal axis of the conduit to permit the flexible body to be spread open at said joint for application around the conduit and for removal therefrom, said joint being defined by a pair of opposed longitudinal edges, at least one of said longitudinal edges including sealing means positioned for engagement with the other of said longitudinal edges along a line parallel to the longitudinal axis of the conduit, said joint



lying in an imaginary plane substantially parallel to and passing through the longitudinal axis of the conduit, said body including a stiffening bar adjacent each longitudinal edge of said joint;

(b) transversely extending, inwardly directed, annular, resilient sealing means carried by said flexible body to engage the conduit on opposite sides of the test area;

(c) spreading means carried by said body for spreading said longitudinal edges to a desired longitudinally extended opening therebetween; and

(d) closing means carried by said flexible body to permit said body to define a chamber around the test area to confine a test gas therewith.

4,879,897

METHOD AND APPARATUS FOR THE DETERMINATION OF VISCOSITY

Rodney I. Booth, Newport; David W. Edwards, Fairlight; Colin W. Wrigley, Epping, and Robert A. Orth, North Narrabeen, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

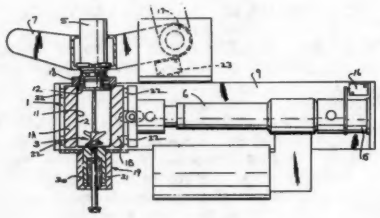
PCT No. PCT/AU86/00238, § 371 Date Apr. 17, 1987, § 102(e) Date Apr. 17, 1987, PCT Pub. No. WO87/01198, PCT Pub. Date Feb. 26, 1987

Continuation of Ser. No. 50,703, Apr. 17, 1987, abandoned. This PCT application Aug. 18, 1986, Ser. No. 328,758

Claims priority, application Australia, Aug. 19, 1985, PH2013; Feb. 13, 1986, PH4578

Int. Cl.[4] G01N *11/14*

U.S. Cl. 73—59 **14 Claims**



1. A method for measuring the viscosity of a liquid at known temperatures which comprises:

(a) introducing the liquid into a vessel;

(b) positioning said liquid containing vessel within a heat transfer means wherein said heat transfer means is an axially split metallic block;

(c) rapidly adjusting the temperature of the said liquid by clamping said vessel within said heat transfer means tightly enough to slightly deform the walls of the vessel so that they substantially conform to the internal walls of said heat transfer means;

(d) stirring said liquid by rotating a stirring means within said liquid at a measured speed;

(e) simultaneously measuring the power consumed by rotating said stirring means at said speed and the temperature of the heat transfer means; and

(f) converting the measured power consumption to a viscosity measure and recording the said viscosity measure at the measured temperature.

4,879,898

APPARATUS FOR SHIELDING AND PROTECTING AN AIR FLOW RATE METER DISPOSED IN THE INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE FROM AIR COLUMN FLUCTUATIONS

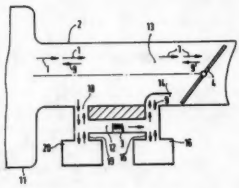
Franz Bamer, Vienna, Austria, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,890

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417052

Int. Cl.[4] G01F *15/02*

U.S. Cl. 73—118.2 **5 Claims**



1. An apparatus for shielding and protecting an air flow rate meter, having a temperature-dependent resistor, which measures the mass of air aspirated by an internal combustion engine, from air column fluctuations arising in an intake tube of an engine as a result of the aspirating action of the engine, which includes an air intake tube, a conduit means connected with said air intake tube for aspirating air therethrough, said air flow rate meter is disposed in said conduit means through which a portion of said aspirated air mass flows, a first damping chamber connected to said conduit means via only one flow connection upstream of said air flow meter, and a second damping chamber connected to said conduit means downstream of said air flow rate meter and arranged to communicate with said conduit means via only one flow connection in the vicinity of said air flow rate meter.

4,879,899

SHEAR STRESS GAUGE

Patrick Leehey, Swampscott, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

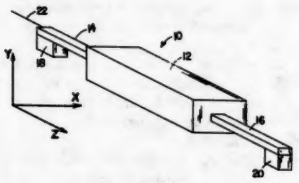
Filed Apr. 27, 1988, Ser. No. 186,891

Int. Cl.[4] G01M *9/00*

U.S. Cl. 73—147 **12 Claims**

1. Shear stress gauge comprising an elongate body having a longitudinal axis oriented transverse to fluid flow, the body disposed within the viscous sublayer of the turbulent boundary layer flow across a wall, the body further having a plane of symmetry, the plane of symmetry passing through the longitudinal axis of the body and normal to the wall;

apparatus for supporting and constraining the body for deflections about the longitudinal axis; and



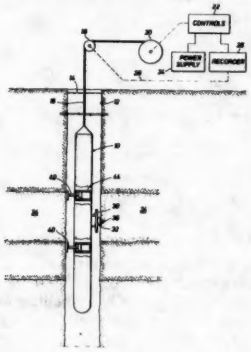
deflection measuring apparatus responsive to angular deflections about the longitudinal axis, the angular deflections substantially linearly related to shear stress on the wall.

4,879,900

HYDRAULIC SYSTEM IN FORMATION TEST TOOLS HAVING A HYDRAULIC PAD PRESSURE PRIORITY SYSTEM AND HIGH SPEED EXTENSION OF THE SETTING PISTONS

Gregory N. Gilbert, Houston, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Jul. 5, 1988, Ser. No. 215,144
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] E21B 49/08
U.S. Cl. 73—155 12 Claims



8. A formation testing tool for measuring the pressure within a formation penetrated by a well borehole comprising:

(a) sample drawing means having a snorkel and locatable within the well borehole for establishing, through the wall of the well borehole and isolated from pressures within the well borehole, a snorkel-ended direct fluid flow path communicating with an adjacent formation;

(b) fluid drawing means coupled with said sample drawing means for drawing fluid from the adjacent formation;

(c) seal means sealing around said snorkel to substantially remove the well borehole pressure from the immediate area of the snorkel-ended direct fluid flow path to enable formation fluid to define pressure acting on said sample drawing means; and

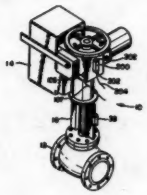
(d) means for continuously loading said seal means during operation of said fluid drawing means to prevent formation invasion by well borehole fluid.

4,879,901

SYSTEM FOR EVALUATING THE CONDITION AND PERFORMANCE OF A VALVE AND VALVE OPERATOR COMBINATION

Robert L. Leon, Roslyn, Pa., assignor to Liberty Technology Center, Inc., Conshohocken, Pa.

Continuation-in-part of Ser. No. 87,541, Aug. 20, 1987, Pat. No. 4,805,451. This application Apr. 22, 1988, Ser. No. 185,210
Int. Cl.[4] F16K 31/05; G01L 05/00; G01P 13/00
U.S. Cl. 73—168 15 Claims



1. A device for measuring and indicating the forces on a valve stem of a valve having an operator within an operator housing, over at least a portion of the valve stroke, the device comprising:

first strain sensor means secured to a valve yoke and substantially parallel to the valve stem for sensing strains experienced by the valve yoke which are proportional to the forces on the valve yoke and are equal and opposite to the forces on the valve stem, the first strain sensor means for generating first electrical signals proportional to the forces on the valve stem;

second strain sensor means secured to the valve operator housing for sensing strains experienced by the operator housing, the second strain sensor means for generating second electrical signals proportional to forces on the operator housing; and

display means electrically connected to the first and second strain sensor means for receiving the first and second electrical signals and for indicating the forces on the valve stem and the operator housing.

4,879,902

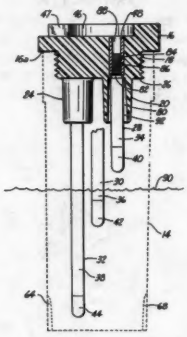
LEVEL CONTROL STRUCTURE WITH PROBES

Peter J. Loniello, Richfield, Minn., assignor to DRI Steem Humidifier Co., Hopkins, Minn.

Filed Aug. 12, 1988, Ser. No. 231,715
Int. Cl.[4] G01F 23/24, 23/00
U.S. Cl. 73—304 R 7 Claims

1. A level control structure comprising a probe assembly body member; at least one metallic cylindrical insert extending through said body member; a metallic sensing probe connected to said insert and extending outwardly from the body member;

and a sleeve extending from said body member and about said probe for protecting a portion of said probe adjacent said body



member, said sleeve being spaced from said probe along a selected distance of the length of the probe.

4,879,903

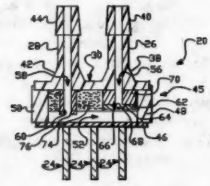
THREE PART LOW COST SENSOR HOUSING

Jeffery E. Ramsey, Newark; Janusz Bryzek, and Joseph R. Mallon, Jr., both of Fremont, Calif., assignors to Nova Sensor, Fremont, Calif.

Filed Sep. 2, 1988, Ser. No. 241,030

Int. Cl.[4] G01L *7/08, 9/06, 19/14*

U.S. Cl. 73—431 **40 Claims**



17. A sensor apparatus comprising:

a housing formed from a thermoplastic material and defining a chamber;

wherein said housing includes an upper portion including an upper wall region having first and second vent ports formed therein, a center portion including first and second opposed side-wall regions and a lower portion including a lower wall region;

wherein said center portion is disposed between said upper and lower portions and is hermetically bonded to said upper and lower portions;

wherein said upper portion includes an integral first external tube in communication with the first vent port and includes an integral second external tube in communication with the second vent port;

a glass member bonded to said housing within the chamber, said glass member having a hole formed therein, the hole being aligned with the first vent port;

a semiconductor electromechanical sensor means including a semiconductor element including first and second surfaces, said semiconductor element being bonded to said glass member such that said first surface is in communication with the first vent port through the hole;

wherein said upper portion includes an internal conduit which extends within the chamber and is in communication with the second vent port, said internal conduit including a distal portion which is disposed deeper within the chamber than is said pressure transducer means;

at least three respect first pin terminals extending through said first side-wall region, each respective first pin terminal including a respective short segment within the chamber and a respective elongated segment outside the chamber;

at least three respective second pin terminals extending through said second side-wall region, each respective second pin terminal including a respective short segment within the chamber and a respective elongated segment outside the chamber;

first coupling means for electrically coupling said semiconductor element to said respective short segments of said respective first pin terminals;

second coupling means for electrically coupling said semiconductor element to said respective short segments of said respective second pin terminals; and

an inert gelatinous fill material partially filling the chamber such that said semiconductor element and said first and second coupling means are immersed in said fill material and such that said distal portion of said internal conduit is not immersed in said fill material;

whereby a non-filled region of the chamber is in communication with the second vent port.

4,879,904

IONIC CONDUCTIVITY ACCELEROMETER

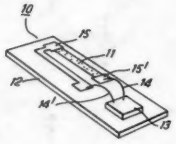
John E. A. Shaw, West Drayton, and Brian C. Webb, Sunbury, both of England, assignors to Thorn EMI PLC, London, England

Filed Mar. 22, 1988, Ser. No. 171,549

Claims priority, application United Kingdom, Mar. 25, 1987, 8707091

Int. Cl.[4] G01P *15/08, 15/12*

U.S. Cl. 73—517 R **7 Claims**



1. A device for measuring acceleration comprising: an electrically insulative substrate; an ionically conductive layer, said layer comprising a composite layer containing an ionically conductive material and an electrically insulative inert material; and spaced apart electrodes in contact with said layer; wherein acceleration of said device is indicated by an e.m.f. generated between said spaced apart electrodes.

4,879,905

APPARATUS FOR MEASURING THE INTERNAL FRICTION OF A TRANVERSELY VIBRATING METAL SPECIMEN

Hong-Bin Chen; Lien-Kuei Chang; Shern-Ji Tsay; Tung-Sheng Chou, all of Kaohsiung, and Fong Shiue, Taipei, all of Taiwan, assignors to China Steel Corporation, Haohsiung, Taiwan

Filed Oct. 11, 1988, Ser. No. 255,872

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—579 **5 Claims**

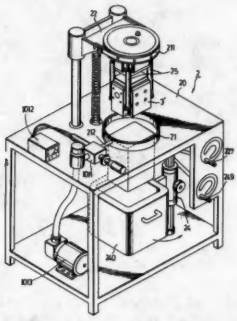
1. A measuring apparatus for measuring internal friction of a metal specimen comprising:

a machine table;

a container including a container body fixed on said machine table and having an open upper end, and a container lid covering said upper end of said container body;

an ascending device carrying said container lid thereon for moving vertically said container lid into and out of engagement with said container body, said container lid covering said container body when one is engaged with the other; and

a measuring unit carried on a lower surface of said container lid and movable into said container body when said container lid engages with said container body, said measuring unit including a driving member having a channel



formed therein for causing the specimen to vibrate for the purpose of measuring internal friction, a detecting member spaced apart from said driving member and having a channel formed in said detecting member for detecting the vibrations in the specimen, a cold water feeding pipe communicating with both said channels of said driving member and said detecting member, and a drain pipe also communicating with both said channels of said driving member and said detecting member.

4,879,906

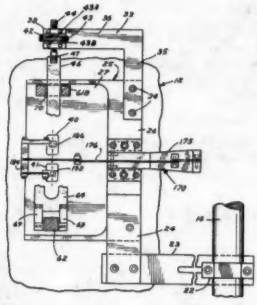
VIBRATION DAMPED MOUNTING FOR EXTENSOMETER SYSTEM

Harry R. Meline, Minnetonka; Richard A. Meyer, Carver, and Nebojsa D. Kovacevic, Plymouth, all of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 186,367, Apr. 26, 1988. This application Jul. 29, 1988, Ser. No. 226,423

Int. Cl.[4] G01B *5/30*; G01N *3/08, 17/00*

U.S. Cl. 73—826 **11 Claims**



1. An extensometer apparatus comprising means for contacting a specimen for use with the extensometer apparatus, a frame mounting the means for contacting the specimen, means for indicating movement of the specimen contact means with respect to a reference position, the extensometer apparatus including a mass supported on a movable member in the apparatus transmitting vibrations to the extensometer apparatus which affect an output of the means for indicating movement, and means for coupling the mass to the member comprising a layer of damping material mounting the mass relative the member so that vibrations are not directly transmitted to the mass except through the layer of vibration damping material.

4,879,907

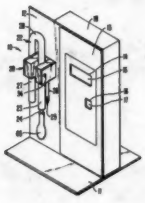
SOAP FILM FLOWMETER

Dwight Patterson, Fairfield, and Neil A. Levine, Davis, both of Calif., assignors to Humonics, Inc., Fairfield, Calif.

Filed Feb. 13, 1987, Ser. No. 14,577

Int. Cl.[4] G01F *1/708*

U.S. Cl. 73—861.05 **12 Claims**



1. In a gas flowmeter for measuring the flow rate of a gas, the flowmeter having a gas flow tube with an inlet for connection to a gas flow source and an outlet, means for introducing a soap film adjacent said inlet, and means for detecting the rate of passage of a soap film within said tube between a pair of measuring location; the improvement wherein said gas flow tube includes means for substantially equalizing the pressure on opposite sides of the soap film within said tube in the region between said inlet and said detecting means to minimize the diffusion of the gas through the soap film during flow rate measurement, said pressure equalizing means comprising a U-shaped gas flow tube mounted in an inverted attitude, said U-shaped gas flow tube having first and second leg portions, said first leg portion including the gas flow inlet and having a length sufficiently great to span the pair of measuring locations, said second leg portion including the outlet.

4,879,908

SUCTION AIR MEASURING DEVICE

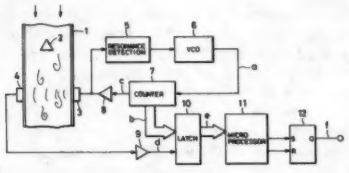
Kazumichi Tutumi, Hyogo, Japan, assignor to Mitisubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,933

Claims priority, application Japan, Mar. 19, 1987, 62-64904

Int. Cl.[4] G01F *1/32*

U.S. Cl. 73—861.23 **2 Claims**



1. A suction air measuring device for an engine, comprising a vortex generating member inserted into a suction conduit of said engine, vortex detection means for detecting a vortex signal indicative of Karman vortex generated behind said vortex generating member said vortex detection means including an ultrasonic transmitting vibrator disposed in said suction conduit together with an ultrasonic receiving vibrator such

that an ultrasonic wave from said transmitting vibrator is phase-modulated by Karman vortex in said suction conduit and received by said receiving vibrator, said receiving vibrator outputting a phase-modulated signal, said vortex detection means further including means for obtaining a digital signal from said phase-modulated signal and means for storing said digital signal in a memory means at a predetermined period and a digitizing means for digitizing a content of said memory means to obtain a Karman vortex signal and for setting or resetting said Karman vortex signal when said digital signal of said vortex detection means starts to increase from a lower extreme thereof by a predetermined value and resetting or setting said Karman vortex signal when said digital signal of said vortex detection means decreases from an upper extreme thereof by a predetermined value.

4,879,909

VORTEX SHEDDING FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 922,850, Oct. 24, 1986, Pat. No. 4,747,756, and a continuation-in-part of Ser. No. 31,901, Mar. 30, 1987, Pat. No. 4,776,222, and a continuation-in-part of Ser. No. 31,902, Mar. 30, 1987, Pat. No. 4,807,481. This application Oct. 7, 1987, Ser. No. 105,265

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] G01F *1/32*

U.S. Cl. 73—861.24 **22 Claims**

1. An apparatus for measuring fluid flow comprising in combination:

(a) a body including a flow passage extending from one extremity to the other extremity of the body;

(b) a vortex generator of an elongated cylindrical shape disposed across a first cross section of the flow passage; and

(c) a vortex detector comprising a planar member disposed across a second cross section of the flow passage generally parallel to the vortex generator on a plane generally parallel to the central axis of the flow passage wherein one extremity of the planar member is secured to the wall of the flow passage, a lever member including a fulcrum means disposed generally parallel to the central axis of the flow passage with one extremity connected to the other extremity of the planar member opposite to said one extremity, and a transducer means including a force receiving member connected to the lever member;

wherein said transducer means provides signals related to the frequencies of vortex shedding from the vortex generator as a measure of volume flow rate through the flow passage and the amplitudes of alternating lift forces on the planar member as a measure of mass flow rate through the flow passate.

4,879,910

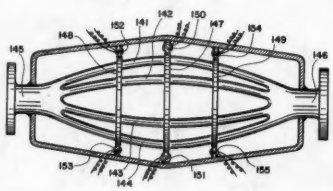
TORSIONAL VIBRATION CONVECTIVE INERTIA FORCE FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 71,777, Jul. 10, 1987, Pat. No. 4,813,289, and a continuation-in-part of Ser. No. 78,206, Jul. 27, 1987, Pat. No. 4,829,832. This application Aug. 24, 1987, Ser. No. 88,571

Int. Cl.[4] G01F *1/78, 1/84*

U.S. Cl. 73—861.37 **6 Claims**



1. A device for measuring rate of fluid flow comprising in combination:

(a) a plurality of curved conduits disposed in a converging-diverging arrangement about an central axis of assembly with first extremities connected to a first port leg and second extremities connected to a second port leg, wherein distance from the central axis of assembly to each of the curved conduits is greater at the midsection of the curved conduit than at each extremity of the curved conduit;

(b) a first interconnecting member joining together first halves of said plurality of curved conduits adjacent to the port leg, and a second interconnecting member joining second halves of said plurality of curved conduits adjacent to the second port leg;

(c) means for rotatively vibrating midsections of said plurality of curved conduits about the central axis of assembly; and

(d) means for measuring rotary vibrations of said first halves and said second halves of curved conduits;

wherein mass flow rate through said plurality of curved conduits is determind from difference in the rotary vibrations about the central axis of assembly between said first halves and said second halves of said plurality of curved conduits.

4,879,911

CORIOLIS MASS FLOW RATE METER HAVING FOUR PULSE HARMONIC REJECTION

Michael J. Zolock, Longmont, Colo., assignor to Micro Motion, Incorporated, Boulder, Colo.

Filed Jul. 8, 1988, Ser. No. 217,012

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **23 Claims**

1. A Coriolis mass flow rate meter comprising:

at least one flow conduit;

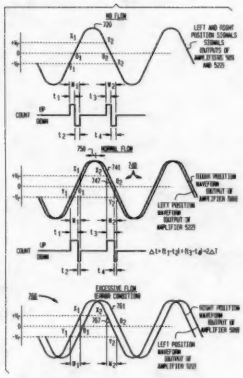
means for sensing movement of said flow conduit caused by opposing Coriolis forces induced by passage of a fluid through said flow conduit and for producing first and second sensor signals responsive to the sensed movement of said flow conduit;

means for oscillating the flow conduit; and

circuit means responsive to said first and second sensor signals for providing a mass flow rate value of the fluid, said circuit means comprising:

means responsive to said first and second sensor signals for determining a time difference occurring among first and second measurement points located on said first sensor signal and a reference point situated on the second sensor signal and which temporally occurs between said first and

second measurement points, wherein said time difference in duration occurring between the duration of a first interval of time occurring between said first measurement point and said reference point and the duration of a second interval of time occurring between said reference point



and said second measurement point and wherein said time difference is a linear function of the value of the mass flow rate of the fluid passing through said flow conduit; and

means responsive to said determined time difference for generating the mass flow rate value.

4,879,912

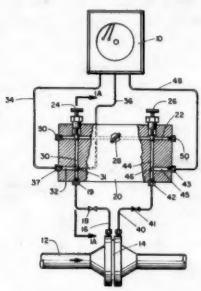
UNITIZED INSTRUMENT MANIFOLD

William H. Suckow, Amarillo, Tex., assignor to J. M. Huber Corporation, Rumson, N.J.

Filed Mar. 8, 1988, Ser. No. 165,662

Int. Cl.[4] G01F *1/425;* G01L *13/02*

U.S. Cl. 73—861.61 **17 Claims**



1. In a valve manifold for controlling transmission of high pressure and low pressure signals from a pipeline containing a flow restriction orifice plate to a flow measurement instrument for measuring fluid flow through the pipeline in response to the high pressure and low pressure signals, the valve manifold, including a unitized valve body and first, second, and third valve assemblies, each valve assembly at least partially disposed within the unitized valve body and including a bonnet fixedly secured to the unitized valve body, a valve stem threadably secured within the bonnet and axially movable along a stem axis, and a plug having a sealing surface at one end of the valve stem for selectively controlling flow past the valve assembly in response to rotational movement of the valve stem; the unitized valve body including, (a) a first channel through the unitized valve body having first ports at each end thereof and having a first axis, (b) a second channel interconnecting the first channel with a second port for venting pressure from the first channel and having a second axis, (c) a third channel interconnecting the first channel with a third port for inputting the high pressure signal to the unitized valve body, and (d) a fourth channel interconnecting the first channel with a fourth port for inputting the low pressure signal to the unitized valve body, the improvement comprising:

each of the first and second valve assemblies positioned within the unitized valve body along the first channel to selectively control transmission of pressure along the first channel;

the third valve assembly positioned in the unitized valve body along the first channel and between the first and second valve assemblies, such that the sealing surface of the third valve assembly passes through the first axis of the first channel when its valve stem is moved from a fully open position wherein the first channel is roddable to a fully closed position wherein the first channel is not roddable;

an annular seating surface within the unitized valve body spaced radially about the second axis of the second channel for sealing engagement with the sealing surface of the third valve assembly, such that the second port is sealed from the first channel when the third valve assembly is in the fully closed position;

the annular seating surface being positioned radially opposite the bonnet of the third valve assembly with respect to the first axis of the first channel such that the second channel between the first channel and the second port is roddable when the third valve assembly is in the fully open position; and

a flow passageway between the unitized valve body and the plug of the third valve assembly for fluid communication along the first channel between the first and second valve assemblies when the third valve assembly is in the fully closed position.

4,879,913

TRANSDUCER FOR BENDING AND TWISTING MOMENTS

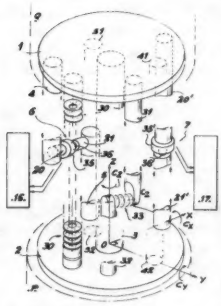
Bernard Lerat, Thones, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Mar. 15, 1988, Ser. No. 168,403

Claims priority, application France, Mar. 19, 1987, 87 03820

Int. Cl.[4] G01L *5/16*

U.S. Cl. 73—862.04 **3 Claims**



3. Transducer for bending and twisting moments exerted between two mechanical assemblies (P, Q) comprising two rigid and substantially parallel plates (1, 2), each plate being coupled to one respective assembly, a flexible beam (3) interconnecting the two rigid plates and substantially perpendicular

thereto and transmitting the efforts exerted between the two assemblies, a first device (6) for measuring the displacement or force characterizing the twisting moment (CZ) of the beam and a second device (7) for measuring the displacement or force characterizing one of the bending moments (CY) of the beam, the measuring devices being connected to each of the rigid plates (1, 2) and the second device (7) being substantially rectilinear and parallel to beam (3) and at least one of the displacement or force measuring devices (6, 7) being constituted by a sensitive element (22, 35) connected to each of the rigid plates by bars (20, 21) and at least one of the force measuring devices (6, 7) being prestressed, so that the tension-compression stresses undergone by bars (20, 21) and the sensitive element (35) are always in the same direction.

4,879,914

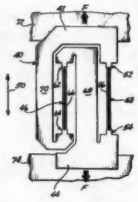
UNITARY PUSH-PULL FORCE TRANSDUCER

Brian L. Norling, Mill Creek, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 27, 1989, Ser. No. 316,341

Int. Cl.[4] G01L *1/10*; G01P *15/10*; G01B *17/04*

U.S. Cl. 73—862.59 **10 Claims**



1. A force transducer capable of being attached between first and second structures, the force transducer comprising a unitary body formed from a crystalline substrate, the unitary body comprising:

first and second mounting elements for mounting the force transducer to the first and second structures, respectively;

first and second force sensing elements, each force sensing element having first and second ends, a line extending from the second end to the first end of each force sensing element defining a force sensing axis for the force sensing element, each force sensing element being sensitive to a force exerted in either direction along its force sensing axis, the force sensing elements being oriented with their force sensing axes parallel to and aligned with one another; and

coupling means for interconnecting the mounting elements and force sensing elements such that the first force sensing element has its first end connected to the second mounting element and its second end connected to the first mounting element, and such that the second force sensing element has its first end connected to the first mounting element and its second end connected to the second mounting element, whereby a force exerted on the force transducer by the structures parallel to the force sensing axes results in a compression force on one force sensing element and a tension force on the other force sensing element.

4,879,915

SAMPLE INJECTION MEANS

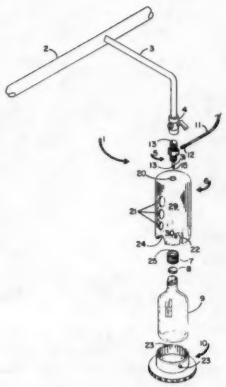
R. Wilson Spencer, P.O. Box 22586, Houston, Tex. 77227

Continuation of Ser. No. 26,824, Mar. 17, 1987, Pat. No. 4,791,821. This application Dec. 20, 1988, Ser. No. 287,344

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] G01N *1/10*

U.S. Cl. 73—864.74 **1 Claim**



1. A sample injection means, comprising a single vented needle having a body, said body having an upper end and a lower end, a needle shaft extending from said lower end, said shaft having a tip thereon, an injection passageway running through said body and communicating between the exterior of said body above said shaft and the exterior of said shaft, and a vent passageway, running through said body and communicating between the exterior of said body above said shaft and the exterior of said shaft, when in use said upper end being connected to a valve and said lower end being connected to a receptacle for receiving samples.

4,879,916

CONTACT SENSOR FOR CALIPERING PIECES SUCH AS WORKPIECES

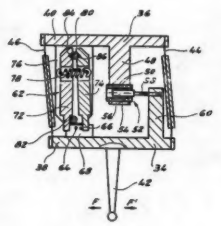
Denis Juillerat, Le Locle, Switzerland, assignor to Meseltron S.A., Switzerland

Filed Jun. 28, 1988, Ser. No. 212,636

Claims priority, application Switzerland, Jun. 29, 1987, 02 443/87

Int. Cl.[4] G01B *5/00*

U.S. Cl. 73—865.8 **11 Claims**



1. A contact sensor for calipering pieces such as workpieces, comprising:

a feeler;
a suspension device comprising at least one first part to which the feeler is rigidly connected and a second part, the first and second parts being assembled for movement relative to one another in a first direction;
a transducer for measuring the amplitude of the relative movement of the first and second parts; and
force generating means for holding the feeler in a stable rest position and allowing the feeler to exert on the surface of a place to be calipered a bearing force which initially increases linearly and rapidly as the feeler moves away from its rest position in a calipering zone and which then increases slowly in a disengagement zone,
said force generating means comprising first elastic means connected to one of aid parts of the suspension device and deformable in said first direction, and an assembly carried by the other part of the suspension device, which assembly comprises:
abutment means,
two mobile elements which interact with the first elastic means,
and second elastic means acting on said two mobile elements to permanently bias them into abutting engagement with the abutment means from opposite directions,
the first and second elastic means being such that, in the calipering zone, the mobile elements remain in contact with the abutment means to cause the first elastic means to deform and, in the disengagement zone, one of the mobile elements progressively moves away from the abutment means under the action of the first elastic means and against the action of the second elastic means which in turn is deformed,
said first elastic means comprising two oppositely acting elastic members on which the mobile elements act reciprocally in opposite directions and which are prestressed by these elements when the feeler is in the rest position to a degree sufficient for said elastic members to remain under tension to a greater or lesser degree as long as the movement of the feeler is situated within the calipering zone.

4,879,917

APPARATUS FOR DETERMINING THE ACTIVE INGREDIENT RELEASE FROM SOLUBLE PHARMACEUTICAL PRODUCTS

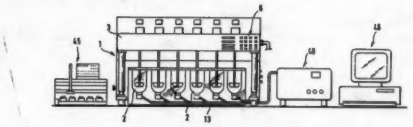
Heinz Eppelmann, Johannes-Calvin-Str. 15, D-6507, Ingelheim, and Franz Fahler, Birkenwaldstr. 35, D-6053, Obertshausen, both of Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,923

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703621

Int. Cl.[4] G06F *15/46*

U.S. Cl. 73—866 **8 Claims**



1. Apparatus for determining the release of active ingredients of soluble pharmaceutical products, said apparatus comprising:
(a) a stand having an upper section and a connector for air and liquid positioned in said upper section;
(b) at least one vessel disposed within said stand and positioned beneath said upper section, each vessel having an opening in a lower portion of said vessel and a valve communicating with said opening for emptying liquids contained in said vessel; and
(c) an agitator at least partially disposed within each vessel, each agitator having a hollow vertical shaft linked to said connector and, said each agitator having an agitator blade having channels extending across said blade to outer edges of said blade and terminating in free outlets, said channels communicating with said hollow vertical agitator shaft.

4,879,918

GYRO COMPASS

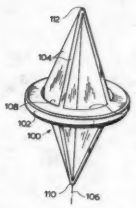
Takeshi Hojo; Kanshi Yamamoto; Shinichi Kawada, all of Kuroiso; Kazushige Murabayashi, Kawachi; Mamoru Akimoto, Kuroiso, and Michio Fukano, Ohtawara, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 363,408

Claims priority, application Japan, Oct. 28, 1987, 62-272076; Oct. 28, 1987, 62-272077

Int. Cl.[4] G01C *19/38*

U.S. Cl. 74—5.47 **4 Claims**



1. A gyro compass comprising:
(a) a gyro case incorporating a gyro of which the spin axis is substantially horizontal;
(b) a vertical ring disposed around the outer periphery of said gyro case and for rotatably supporting said gyro case around a vertical axis;
(c) a follow-up pickup for detecting an angular displacement between said gyro case and said vertical ring around said vertical axis;
(d) an accelerometer having an input axis parallel to said spin axis;
(e) a vertical torquer mounted on said vertical ring for applying a torque of magnitude proportional to an input signal to said gyro case around said vertical axis; and
(f) a control apparatus for receiving an output signal of said accelerometer and for supplying its output to said vertical torquer, in which during a predetermined time after the gyro compass is started to operate, the output signal from said accelerometer is differentiated to produce a differentiation signal which is then supplied to said vertical torquer to reduce a settling time of the north-seeking action.

4,879,919

TRANSMISSION EQUIPPED WITH REVERSE MECHANISM

Satoshi Sekizaki, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1987, Ser. No. 82,515

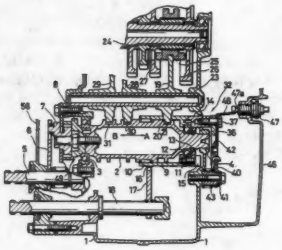
Claims priority, application Japan, Aug. 8, 1986, 61-121011[U]

Int. Cl.[4] F16H *5/06*

U.S. Cl. 74—337.5 **5 Claims**

1. A transmission having a reverse mechanism including a forward shift drum both ends of which are rotatably supported by an engine case, and a reverse shift drum concentrically arranged with said forward shift drum and relatively rotatably fitted to the peripheral surface of said forward shift drum, said transmission comprising
a first rotation positioning mechanism provided on one end portion of said forward shift drum for regulating a rotary position of said forward shift drum; and

a second rotation positioning mechanism provided on said reverse shift drum at an end portion thereof opposite to said one end portion for regulating a rotary position of said reverse shift drum;



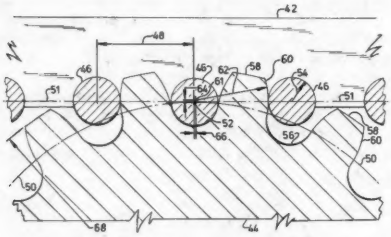
said first and second rotation positioning mechanisms being disposed at an outer side of said engine case, respectively.

4,879,920

ANTIBACKLASH GEARS INCLUDING RACK AND PINION GEARS

Ewald F. Kerkhoff, 4365 Loch Alpine Dr. E., Ann Arbor, Mich. 48103

Filed Apr. 13, 1987, Ser. No. 37,532
Int. Cl.[4] F16H *1/04*
U.S. Cl. 74—465 **13 Claims**



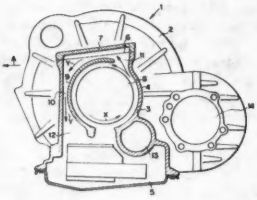
1. A meshing gear construction comprising a first gear having a plurality of fixed teeth extending therefrom, said teeth alternatingly separated by a plurality of roots each having a radial centerline, faces on either side of each fixed tooth, each root being a continuation of a pair of faces of two adjacent teeth, a second gear having a plurality of rollers thereon rotatble relative to the second gear, said rollers meshing with the fixed teeth of the first gear, and said meshing comprising rolling contact of at least two rollers with one first gear fixed tooth at all instants of motion wherein said rollers comprise cylindrical rollers and teh faces of said fixed teeth comprise circular arcs in profile and wherein a radial centers of fixed tooth circular arc face lies otsdie a pitch circle of the first gear and between the circular arc face and the radial centerline of an adjacent root.

4,879,921

TRANSAXLE CASING FOR AUTOMATIC TRANSMISSION

Toshiyuki Asada, Susono; Seitoku Kubo, Toyota; Shinya Nakamura, Owariasahi; Masafumi Kinoshita, Toyota, and Takaaki Kuroda, Hirokawa, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 1, 1988, Ser. No. 162,593
Claims priority, application Japan, Mar. 4, 1987, 62-49095
Int. Cl.[4] F16H *57/04*
U.S. Cl. 74—467 **7 Claims**



1. A transaxle casing structure for accommodating a transmission gear set having a plurality of rotary members arranged on a common axis, the transaxle casing comprising:

a cover wall enclosing said transmission gear set;

an oil sump disposed below said transmission gear set for receiving lubricating oil therein; and

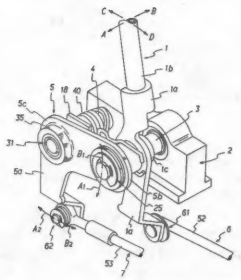
a continuous partition disposed between a radially outermost one of said rotary members of said transmission gear set and said cover wall and generally extending from a top of said outermost rotary member to a bottom of said outermost rotary member, an oil return passage being defined between the partition and said cover wall for guiding lubricating oil into said oil sump, said oil return passage having a first opening between one end of said partition and said cover wall and a second opening between another end of said partition and said cover wall.

4,879,922

OPERATING DEVICE FOR TRANSMISSION

Kazuhiro Suzuki, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed Apr. 20, 1987, Ser. No. 39,863
Claims priority, application Japan, Sep. 2, 1986, 61-206436
Int. Cl.[4] G05G *9/16*; F16C *1/10*
U.S. Cl. 74—500.5 **4 Claims**



1. A transmission operating device comprising:

(a) a change lever;

(b) a shift cable connected to the change lever;

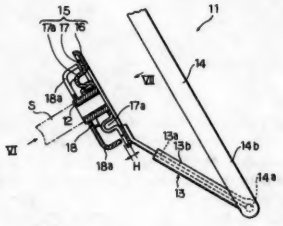
(c) a ball crank having a first arm, a second arm and a middle part therebetween;
(d) a select cable connected to the first arm of the bell crank;
(e) a bearing base;
(f) an operating shaft having a supported end, a free end and a middle part, said middle part being fixed with the change lever;
(g) a first bearing provided on the bearing base to be connected with the support end of the operating shaft rotatably and inclinably;
(h) a second bearing provided at the free end of the operating shaft for rotatable connection with the second arm of the bell crank;
(i) a fixed shaft, of which one end is fixed to the bearing base, projecting from the bearing base;
(j) a third bearing provided at the other end of the fixed shaft to support the middle part of the ball crank rotatably; and
(k) a spring on said fixed shaft: with opposite ends engaging said operating shaft.

4,879,923

STEERING WHEEL

Atsushi Nagata, Nagoya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 25, 1988, Ser. No. 198,823
Claims priority, application Japan, May 30, 1987, 62-136987
Int. Cl.[4] B62D *1/04*
U.S. Cl. 74—552 **6 Claims**



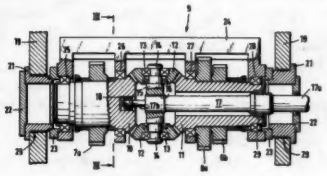
1. A steering wheel capable of absorbing impact forces comprising:
(a) a core of a ring portion;
(b) a boss disposed at a center of said core of the ring portion;
(c) cores of a spoke portion disposed between said core of the ring portion and said boss;
(d) a first deformable member interposed between said boss and said cores of the spoke portion for coupling the boss with the cores of the spoke portion, and provided with a plurality of deformable arm portions extending radially from the boss and being plastically deformable; and
(e) a second deformable member fixed to the boss and disposed a predetermined distance from said first deformable member to allow said first deformable member, upon impact, to deform prior to abutting and continuing to deform along with said second deformable member.

4,879,924

GEARING FOR DRIVING THE ROLLS OF A ROLL TRAIN

Helmut Holthoff, Düsseldorf, and Hermann Möltner, Ratingen, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 225,927
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729470
Int. Cl.[4] F16H *1/30, 1/40*
U.S. Cl. 74—799 **7 Claims**



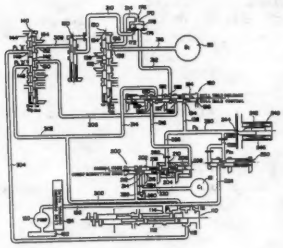
1. Gear unit for driving a roll of a roll train with a number of consecutively arranged roll stands, in which a planetary gear set comprised of bevel gears is provided at at least one output shaft, the planetary gear axis or axes of which extend crosswise to the output shaft and the sun gears of which are arranged coaxially to the drive shaft, characterized in that neither the sun gears nor the other gears are supported on the output shaft, but in the gear unit housing and the latter has a cross head running parallel to the output shaft and with radially projecting bearings for supporting the gears in the region of the planetary gear set.

4,879,925

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION, INCORPORATING FAIL SAFE AND PROGRESSIVE CREEP CONTROL AND HILL HOLD CONTROL

Yutaka Taga, and Yuji Kashihara, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 16, 1987, Ser. No. 109,305
Claims priority, application Japan, Oct. 21, 1986, 61-250423; Oct. 21, 1986, 61-250424; Oct. 21, 1986, 61-250425; Oct. 21, 1986, 61-250426
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—867 **6 Claims**



1. For an automatic transmission for a vehicle comprising an engine, comprising a source of actuating hydraulic fluid pressure, a gear transmission mechanism which comprises a power output shaft and a plurality of hydraulic fluid pressure actuated friction engaging mechanisms and which is capable of providing any one of a plurality of speed stages according to patterns of engagement and release of said hydraulic fluid pressure

actuated friction engaging mechanism, and a hydraulic speed stage switching system having a plurality of shift valves and switching over supply and non supply of actuating hydraulic fluid pressure to said friction engaging mechanisms; said friction engaging mechanisms including a shift brake and according to engagement of which said power output shaft of said gear transmission mechanism is prevented from turning in a direction to a hydraulic hill hold control system, comprising:

(a) a first control means for opening a port passage when said vehicle is substantially stationary and said engine is substantially in idling operational condition; and

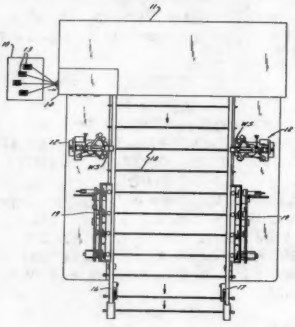
(b) a second control means for setting up a first hydraulic fluid passage in said hydraulic speed stage switching system when said gear transmission mechanism is switched to a certain speed stage and supplying actuating hydraulic fluid pressure to said shift brake via said port passage of said first control means and said first hydraulic fluid passage set up in said hydraulic speed stage switching system so as to engage said shift brake when said first control means opens said port passage and said gear transmission mechanism is switched to said certain speed stage.

4,879,926

APPARATUS FOR CUTTING, CONVEYING AND PROGRAMMABLY STRIPPING WIRE SEGMENTS

Kenneth Wollermann, Mukwonago, and Ragnar Gudmestad, Wauwatosa, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Aug. 31, 1988, Ser. No. 238,590
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.51 **33 Claims**



1. A programmable stripper for cutting or cutting and removing selectively variable length insulation portions from the ends of insulated wire segments (218) sequentially presented at a workstation (WS) comprising:

a base frame (21, 221) mountable in fixed relation to said workstation;

a carriage (31, 231) mounted on said base frame for movement in a first plane (P1) toward and away from said workstation;

a first drive means (58, 258) operatively interposed between said base frame and said carriage for moving said carriage to positions closer or farther from said workstation as required by the length of said insulation portion to be cut;

a turret (76, 276) mounted on said carriage for movement relative thereto and having,

a plurality of individual mounting positions (87, 287), and

an insulation cutting means (101A, 101B, 301A, 301B) including a knife means (91A, 91B, 291A, 291B) mounted on said turret at each of said mounting positions, said knife means movable between an open non-cutting position and a closed insulation cutting position wherein a wire receiving gap exists in said knife means,

a second drive means (90, 290) for selectively moving said turret relative to said carriage to place any selected one of said cutting means, when in said open position, at said workstation;

a first actuating means (170, 370) for effecting cutting movement of said cutting means to said closed position to transversely cut said insulation and create a cut portion of insulation at the end of said wire segment;

gripping and guiding means (141, 341) mounted on said carriage and movable between an open position and a closed position relative to said cut portion of insulation;

a second actuating means (180, 380) for effecting said movement of said gripping and guiding means between said open and closed positions; and

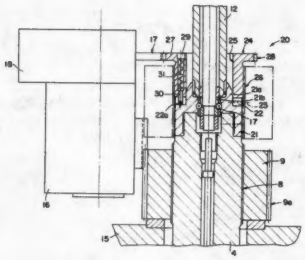
a third actuating means (190, 390) for effecting movement of said gripping and guiding means toward said workstation when said gripping means is in said open nongripping position and away from said workstation when said gripping means is in said closed gripping position during stripping of said cut portion of insulation.

4,879,927

POSITIONING DEVICE FOR SCREWING AND UNSCREWING A NUT

Gérard Sevelinge, Montceau Les Mines, France, assignor to Framatome, Courbevoie, France

Filed Apr. 16, 1987, Ser. No. 39,127
Claims priority, application France, Apr. 18, 1986, 86 05614
Int. Cl.[4] B25B *21/00*
U.S. Cl. 81—56 **4 Claims**



1. An automatic positioning device for screwing and unscrewing an independent nut (9) on a screwing element (4) having external threads (26), said device comprising

(a) an externally threaded bush (24) for transferring said nut (9);

(b) means for axial alignment of said bush (24) relative to said screwing element (4), said means comprising an extension piece (21) placed on a head of said screwing element and having a centering stud (21*a*) in its upper part, on which stud said bush (24) is positioned coaxially relative to an axis of said screwing element (4); and

(c) means for angular alignment consisting of an axially directed retractable finger (30) fitted in said bush (24) and interacting with an adjusting washer (22) resting on said extension piece (21).

4,879,928

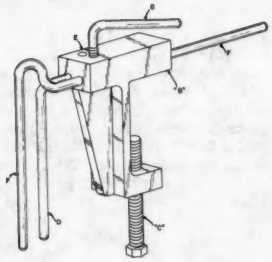
BALLOON STRETCHER

Scott E. Juslin, and Lee Juslin, both of Box 454, Rte. 4, Northwood, N.H. 03261

Filed Aug. 8, 1988, Ser. No. 229,537
Int. Cl.[4] B25B *9/00*
U.S. Cl. 81—488 **5 Claims**

1. A device designed to be used with latex balloons five inches and larger consisting of a molded base, and adjustable

bottom bolt, cooperating with said base for clamping the device to a countertop, said base having one stationary rod and



one adjustable rod with said adjustable rod being controlled by a set screw and a finger loop.

4,879,929

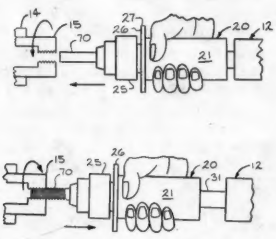
TAPPER/THREADER ASSEMBLY

Alfred C. Roth, 2388 Yost Blvd., Ann Arbor, Mich. 48104

Filed Jun. 6, 1988, Ser. No. 202,451

Int. Cl.[4] B23B *13/12, 25/04, 31/02;* **B23G** *1/26*

U.S. Cl. 82—110 **7 Claims**



1. A tapper/threader assembly for use in a lathe having a rotatable chuck and a tail stock, said tapper/threader assembly having a locked position and an unlocked position, said assembly comprising, in combination, a generally cup-shaped sleeve housing having a mounting shaft extending from one end, a piston member mounted for reciprocation within said sleeve housing, a shank member connected to said piston member having a tapered end extending outwardly from said sleeve housing, wherein said tapered end may be received by the lathe tail stock said housing being freely rotatable relative to said piston member when said assembly is in the unlocked position, spring means urging said housing toward said piston member, said spring means positioned within said sleeve housing in surrounding relationship with said shank member, locking means for selectively preventing relative rotation between said piston member and said sleeve housing, thereby selectively providing said locked and unlocked positions and a bearing assembly mounted on said shank member adjacent said housing.

4,879,930

TOOL ARRANGEMENT HAVING ANGULAR POSITION FIXING MEANS

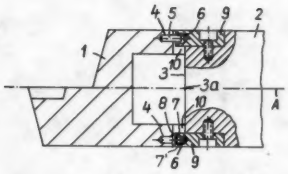
Rainer Von Haas, Geesthacht, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 207,012

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721158

Int. Cl.[4] B23B *29/04, 29/22*

U.S. Cl. 82—158 **5 Claims**



1. In a rotationally symmetrical tool assembly having a rotary axis and including a first component constituted by a tool holder and having a first engagement face, a second component constituted by a tool head and having a second engagement face; said second component being removably attached to said first component such that said first and second engagement faces are in a contacting relationship with one another and are oriented perpendicularly to said rotary axis; a fitting bore provided in one of said components; a guide bore provided in the other of said components; said fitting bore and said guide bore being oriented towards one another; and a securing pin projecting from said fitting bore and extending into said guide bore for determining and maintaining a desired angular position of said second component relative to said first component; the improvement comprising

(a) at least one additional fitting bore provided in said one of said components and at least one additional guide bore provided in said other of said components, whereby the securing pin projecting from a selected one of said fitting bores is insertable to a selected one of said guide bores to provide for a selectable angular setting of said second component with respect to said first component; and

(b) a plug inserted in each said guide bore other than the guide bore designated to receive said securing pin upon attaching said second component to said first component for preventing said securing pin from being received by the guide bore containing said plug; said plug remaining externally of any of the fitting bores when the first and second components are in an attached state with respect to one another.

4,879,931

METHOD FOR TRANSPORTING AWAY PANEL SECTIONS CUT OFF A WORKPIECE PANEL ALONG A CUTTING PLANE IN A PANEL SAW

Erwin Jenkner, Lindenstrasse 13, Gechingen, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,452

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702174

Int. Cl.[4] B26D *7/06*

U.S. Cl. 83—23 **3 Claims**

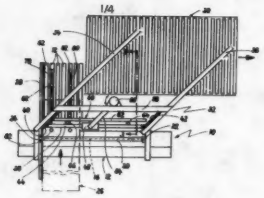
1. A method, in a panel saw, for transporting away at least one panel section which has been cut off a workpiece panel positioned upon a plane of support and along a cutting plane of said saw at a first machining position thereon, said method comprising the steps of:

raising said panel section above said plane of support after a cut has been made to said workpiece panel;

transporting said panel section along a direction parallel to

said plane of support and perpendicular to said cutting plane to a conveying device at a desired speed;

advancing said workpiece panel along a direction of advance to a new machining position relative to said panel saw at an advancing speed greater than said speed at which said panel section is transported to said conveying device;



fixing said workpiece panel in a new cutting position relative to said saw cutting plane, and

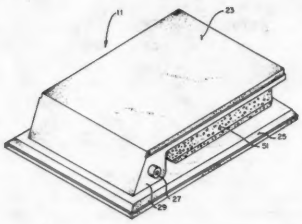
depositing said panel section on said conveying device in laterally offset relation with respect to said workpiece panel and in offset relation to said direction of advance.

4,879,932

MANUALLY OPERABLE PAPER SLITTING DEVICE AND METHOD

William J. Scalise, and Donna J. Scalise, both of 10119 Stonell, St. Louis, Mo. 63123

Filed Apr. 1, 1988, Ser. No. 176,426
Int. Cl.[4] B26F *1/18*
U.S. Cl. 83—30 **5 Claims**



4. The manually operable method of forming diagonally extending and spaced parallel slits in at least one individual paper sheet comprising the steps of:

positioning the individual paper sheet to be slit in aligned and squared orientation relative to a guide surface;

applying resilient, elastic and compressive hold-down forces on opposite sides of and throughout the entire dimension of the individual paper sheet to be slit and in surrounding relationship to the area of the paper to be slit prior to, during and after a slitting operations;

slitting the individual paper sheet along diagonally extending and spaced parallel slits relative to said squared and oriented paper by first piercing and then slitting the individual paper sheet beginning adjacent the pierced paper areas and extending along each of said diagonally extending and spaced parallel slits by means of a pair of slitting surfaces; applying resilient, elastic and compressive forces to the individual paper sheet around said slitting surfaces in order to both hold down the individual paper sheet during slitting and provide stripping from the slitting surfaces following slitting of the paper sheet; and

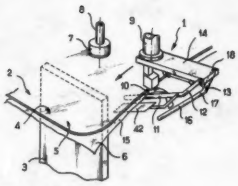
stripping the individual paper sheet from the slitting surfaces following the aforementioned slitting operation.

4,879,933

AUTOMATIC DEVICE FOR TRIMMING SHEETS OF LAMINATED MATERIAL

Eligio M. Floreancig, Jemeppe Sur Sambre; Jean-Claude M. Jandrain, Warnaant Anhee; Desire M. Legros, Jemeppe Sur Sambre, and Jean-Claude M. Simonon, Auvelais, all of Belgium, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Dec. 2, 1987, Ser. No. 127,462
Claims priority, application France, Dec. 2, 1986, 86 16791
Int. Cl.[4] B26D *7/10*
U.S. Cl. 83—76.1 **18 Claims**



1. An automatic cutting device for trimming the parts of an intermediate sheet of plastic material which extends beyond a pane during manufacture of laminated panes, said automatic cutting device comprising:

(a) a support plate;

(b) a blade holder mounted on said support plate for sliding movement in a first direction relative to said support plate;

(c) a blade having two cutting edges carried by said blade holder and extending from said blade holder in a second direction, perpendicular to said first direction;

(d) first means mounted on said support plate for biasing said blade in said first direction;

(e) second means for heating said blade holder to an at least approximately constant temperature;

(f) a first support mounted on said support plate and located on a first side of said blade for holding a part of the sheet of plastic material to be cut in a position at least substantially perpendicular to said cutting edges of said blade;

(g) a second support mounted on said support plate and located on a second side of said blade for holding a part of the sheet of plastic material to be cut in a position at least substantially perpendicular to said cutting edges of said blade;

(h) third means for pivoting said first support back and forth between an operative and an inoperative position;

(i) fourth means for pivoting said second support back and forth between an operative and an inoperative position; and

(j) fifth means for displacing said support plate along the edge of the pane.

4,879,934

SELECTIVE WIRE FEED FOR A PLURALITY OF WIRES

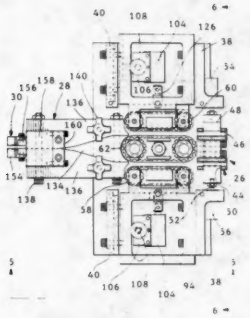
Daniel T. Adlon, and Kenneth F. Folk, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 8, 1987, Ser. No. 107,147
Int. Cl.[4] B25D *1/08*; B65H *51/10*
U.S. Cl. 83—76.9 **20 Claims**

1. A wire feeding unit for selectively feeding either one of a first wire and a second wire, the wires being in parallel relationship, the wire feeding unit being characterized in that:

first, second, and third endless feeding surfaces are provided, the feeding surfaces being in side-by-side relationship with the third feeding surface being between the first and second feeding surfaces, the first and third surfaces having first opposed portions which function as first wire feeding

portions, the first wire being between the opposed portions of the first wire feeding portions, the second and third surfaces having opposed portions which function as second wire feeding portions, the second wire being between the opposed portions of the second wire feeding portions, each of the feeding surfaces being movable along its length in both directions of its length, the opposed portions of each of the first and second wire feeding portions being relatively laterally displaceable towards and away from each other between a feeding position and a non-feeding position, the opposed portions of each of the



wire feeding portions being against each other when in the feeding position and being spaced apart when in the non-feeding position,

actuating means are provided for displacing either of the first and second feeding portions to their feeding positions and for moving one of the endless surfaces which is in its feeding position along its length whereby,

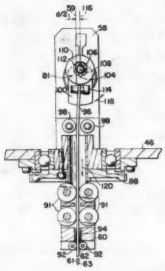
either one of the wires can be selectively fed in a common direction by displacing the wire feeding portions which are associated with the one wire to their feeding position and thereafter moving one of the associated surfaces along its length.

4,879,935

RECIPROCATING KNIFE CUTTER WITH FLEXIBLE DRIVE PORTION

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Filed Feb. 17, 1988, Ser. No. 156,835
Int. Cl.[4] B26D *1/10, 7/26;* D06H *7/00*
U.S. Cl. 83—748 **5 Claims**



1. A reciprocating knife cutter comprising;

an elongated knife having a lower part with a sharpened edge extending along at least a portion of the length thereof,

a frame,

means carried by said frame engaging said lower knife portion and restraining it to reciprocating movement along a straight vertical axis of reciprocation fixed relative to said frame,

an eccentric drive member supported on said frame for driving rotation about a horizontal drive axis fixed relative to said frame, and

an elongated drive portion connected with said lower portion of said knife and extending upwardly therefrom and having an upper end connected with said eccentric drive member for rotation relative to said eccentric drive member about a horizontal eccentric axis fixed relative to said drive member and spaced from and parallel to said drive axis,

said drive portion being laterally flexible in a plane perpendicular to said eccentric axis so that as said eccentric member rotates about said drive axis said drive portion reciprocates said lower portion of said knife along said axis of reciprocation and flexes laterally to accommodate the horizontal component of motion of said eccentric axis,

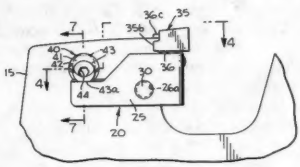
said drive axis of said eccentric drive member being spaced horizontally in a plane perpendicular to said eccentric axis a substantial distance from said reciprocation axis so that the deflection of said drive portion during its downstroke is different from its deflection during its upstroke.

4,879,936

CIRCULAR SAW BLADE HAVING REMOVABLE TEETH

Donald Anderson, P.O. Box 886, Crooked River Ranch, Oreg. 97760

Filed Aug. 13, 1987, Ser. No. 85,019
Int. Cl.[4] B27B *33/08;* B23D *61/06*
U.S. Cl. 83—842 **4 Claims**



1. A circular saw blade comprising:

(a) a disc having a periphery;

(b) a tooth retaining member pivotally mounted on said disc along the periphery thereof;

(c) a tooth disposed between said disc and said retaining member and extending radially from said disc beyond the periphery thereof, (d) said retaining member being pivotally movable between a tooth retaining position and a position removed from the tooth retaining position; and (e) cam locking means mounted on said disc adjacent said retaining member for releasably locking said retaining member to said disc in the tooth retaining position, (f) said tooth being wedged between said retaining member and said disc in response to said retaining member being in the tooth retaining position and said tooth being released in response to said retaining member being removed from the tooth retaining position, (g) said disc including a ridge having oppositely directed planar walls and a radially directed wall interconnecting the planar walls, and said retaining member being a U-shaped member having spaced parallel legs and an interconnection, said parallel legs of said U-shaped retaining member engaging said planar walls, respectively, of said ridge of said disc and said interconnection of said U-shaped retaining member confronting said radially directed wall of said ridge of said

disc when said retaining member is in the tooth retaining position for wedging said tooth between said retaining member and said ridge of said disc, said cam locking means being arranged to engage said U-shaped retaining member for releasably locking said U-shaped retaining member in the tooth retaining position.

4,879,937

SOUND EFFECTOR

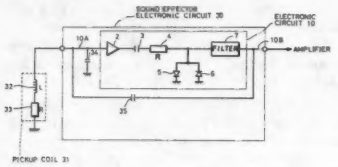
Taichi Hirano, Aichi, Japan, assignor to Prince Tsushinkogyo Limited, Nagoya, Japan

Filed Jan. 27, 1988, Ser. No. 149,148

Claims priority, application Japan, Apr. 28, 1987, 62-105349

Int. Cl.[4] G10H *3/00, 1/02*

U.S. Cl. 84—699 **3 Claims**



1. A sound effector for changing original sounds generated from an electric musical instrument and picked up by a pickup means having an inductance circuit into aurally improved distinctive sounds by suitably distorting the waveform in a frequency band of original sound signals to be enhanced during amplification of the original sound signals, said sound effector comprising:

a resonance circuit having a first capacitor connected with said inductance circuit of said pickup means;

an amplifier circuit composed of semiconductor elements for amplifying an output signal from said resonance circuit;

a filter circuit for receiving the output signal from said amplifier circuit and passing therethrough a signal having a predetermined frequency range;

a clipping circuit having two diodes connected between said amplifier circuit and said filter circuit; and

a positive feedback circuit having a second capacitor connected between said filter circuit and said resonance circuit and serving to positively feed back a signal passed through said clipping circuit and said filter circuit connected to said resonance circuit;

wherein the resonance frequency in said resonance circuit is higher than the frequency at which the gain of an electric circuit including said amplifier circuit, said clipping circuit and said filter circuit is maximum.

4,879,938

CASSETTE MUSIC BOX

Yasuyuki Moriyama, Nagareyama, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,682

Claims priority, application Japan, Apr. 30, 1988, 63-58590[U]

Int. Cl.[4] G10F *1/06*

U.S. Cl. 84—95.2 **10 Claims**

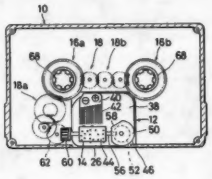
1. A cassette music box comprising:

a casing having an inner space defined therein;

a pair of reels arranged in said casing in a manner to be rotatable and spaced from each other;

said casing being formed in a manner to permit rotation of said reels to be observed from an exterior of said casing;

a music box body arranged in said casing and including a rotating drum and a scale plate operatively engaged with said rotating drum; and



a transmission mechanism for transmitting driving force between said reels and said music box body.

4,879,939

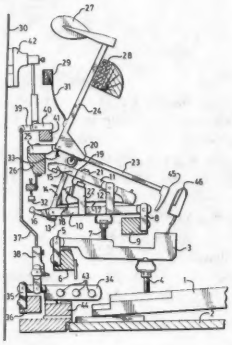
ACTION FOR UPRIGHT PIANO

Paul G. Wall, 4-60 Centreville Road, Kitchener, Ontario N2A 1R9, Canada

Continuation-in-part of Ser. No. 904,114, Sep. 4, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 171,741

Int. Cl.[4] G10C *3/18*

U.S. Cl. 84—240 **12 Claims**



1. In an upright piano action in which each note element of the action comprises a substantially horizontal key in the form of a lever pivotally connected to a frame member of the piano such that the back of the key is raised when the front playing portion of the key is depressed, a back check lever pivotally connected to a frame member and positioned above the back of said key to be raised by upward movement of the back of the key, at least one substantially vertically-oriented piano string installed on a frame member, a hammer-carrying shank pivotally installed on a main action rail about a horizontal axis for moving said hammer towards and away from said at least one piano string, and hammer action means arranged between said back check lever and said hammer shank for actuating said hammer in response to the upward movement of said back check lever, the improvement in which said hammer action means for each note element is installed on a key frame of the piano capable of lateral movement with respect to said piano strings, and in which said hammer action means for each note element comprises:

a catcher arm integrally connected with said hammer shank at a substantial angle such that substantially upward movement of said catcher arm produces essentially rearward movement of said hammer towards said piano string, said catcher arm including a knuckle on its lower surface and further including a catcher at its forward end for engagement with a back check provided on said back check lever

when said key has been fully depressed and said hammer has rebounded from said piano string;

a grand whippen disposed above said back check lever, said grand whippen comprising: a whippen arm pivotally connected near its front end to a whippen rail; a repetition lever pivotally connected to a pivot support arm protruding upwardly from an intermediate point of said whippen arm; a jack pivotally connected to said whippen arm near the rear end of said whippen arm, said jack comprising an upwardly-directed attack arm passing through a slot provided in said repetition lever and a rearwardly-directed bell-crank arm integral with said attack arm; and spring means for biasing said attack arm of said jack forwardly against a stop for positioning directly under said knuckle and for biasing said repetition lever upwardly and against a stop such that said repetition lever does not ordinarily lie below the end of said attack arm in the area of the knuckle, said stops being attached above said whippen arm;

a regulating button positioned below said main action rail and positioned above said bell-crank arm of said jack for engaging said bell-crank arm just prior to said hammer contacting said piano string; and

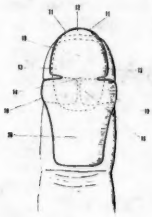
a drop screw fixed with respect to said main action rail and positioned for engaging said repetition lever just prior to said hammer contacting said piano string.

4,879,940

PICK FOR STRINGED MUSICAL INSTRUMENTS

Mark L. Pereira, 1212 Kirkham St., San Francisco, Calif. 94122

Filed Oct. 3, 1988, Ser. No. 252,896
Int. Cl.[4] G10D *3/16*
U.S. Cl. 84—322 **14 Claims**



1. A device to be worn on a human finger or thumb for use for plucking th strings of a stringed musical instrument, comprising:

(a) a string actuating means which is worn over the nail,

(b) a body,

(c) an interface means located at the posterior end of the string actuating means adjacent to said body and connecting the string actuating means and the body, said interface means being narrower than said string actuating means and bendable such that said interface means can be bent to position the string actuating means generally parallel with the nail, as well as conforming to the curvature of said nail,

(d) a counterpresure means connected to the body, which counterpressure means extends from said body in the opposite dirction of the string actuating means and which is generally parallel with the dorsal surface of the distal phalange, and

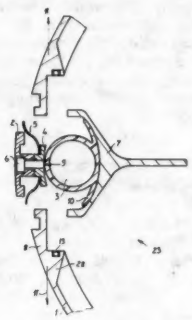
(e) a securement means which extends lateraly from the body in the region between the string actuating means and the counterpressure means.

4,879,941

EJECTABLE CLOSING DEVICE, ESPECIALLY FOR ROCKETS WITH MUNITIONS

Thouron Repé, La Ferte St Aubin, and Denis J. Francois, Checy, both of France, assignors to Thomson-Brandt Armements, Boulogns Billancourt, France

Filed Jun. 24, 1988, Ser. No. 210,973
Claims priority, application France, Jul. 3, 1987, 87 09453
Int. Cl.[4] F42B *25/16*; F16C *35/00*
U.S. Cl. 89—1.14 **9 Claims**



1. An ejectable closing device for a structure said device comprising:

a lid;

means for locking said lid;

means for producing a thrust outwards from said structure;

means for transmitting said thrust to said locking means, causing said locking means to unlock said lid;

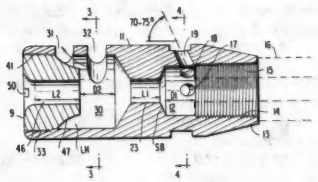
spring means coupled to said transmitting means and extending under the inner edge of said lid for expelling said lid apart from said transmitting means once said lid has been unlocked.

4,879,942

MUZZLE BRAKE WITH IMPROVED STABILIZATION AND BLAST CONTROL

James B. Cave, Rt. 2 Box 2400, Bulverde, Tex. 78163

Filed Oct. 9, 1984, Ser. No. 658,839
Int. Cl.[4] F41C *21/18*
U.S. Cl. 89—14.3 **5 Claims**



1. In a muzzle brake having a one-piece housing member including means for securing said muzzle brake to the muzzle end of a gun, said gun having a gun bore diameter, said one-piece housing member having an integral first interior spent gas impingement member with a central bore therethrough through which a bullet passes and defining first and second chambers, said first chamber being contiguous to said muzzle and volumetrically smaller than said second chamber and a closure member being threadably secured to the end of said housing member opposite the muzzle end, said closure member having a bullet outlet passage and aligned with said central

bore and a reverse cone shape, and a plurality of apertures in said first and said second chambers for venting spent gas to ambient, the improvement wherein:

the combined length of said bullet outlet passage and said central bore being greater than three times the diameter of said gun bore diameter,

said apertures in the volumetrically small chamber being formed of circular bores which are angled away from the muzzle of said gun and are all located in the upper half of said housing member at an angle of between 70 and 75 degrees to the longitudinal axis thereof to prevent spent gases from kicking-up loose debris in the face of a shooter while shooting from a prone position, and

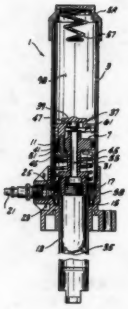
said outlet passage and central bore being of the same diameter, said central bore being of a length at least equal to the diameter of said bore diameter to improve stabilization and attenuate gas passage therethrough during traversal thereof by said bullet.

4,879,943

EXPANSIBLE CHAMBER MOTOR WITH SNAP-ACTING VALVE

Ayzik Grach, Creve Coeur, Mo., assignor to McNeil (Ohio) Corporation, St. Paul, Minn.

Filed May 17, 1988, Ser. No. 194,833
Int. Cl.[4] F01L *15/12, 21/04;* F01B *7/18*
U.S. Cl. 91—224 **7 Claims**



1. An expansible chamber motor comprising

a cylinder,

a piston reciprocable in the cylinder,

a piston rod extending from the piston through one end of the cylinder,

the piston dividing the cylinder into a first chamber between the piston and said one end of the cylinder and a second chamber between the piston and the other end of the cylinder,

the cylinder having an inlet for delivery of pressure air thereto to said first chamber,

the piston having passaging for communication from the first to the second chamber,

the piston and piston rod having a passage for exhaust of air from the second chamber with a valve seat at the end of said passage open to said second chamber,

valve means carried by the piston for opening and closing said passaging in the piston and said exhaust passage,

said valve means being movable relative to the piston between a first position wherein said passaging in the piston is open and said exhaust passage is closed and a second position wherein said passaging in the piston is closed and said exhaust passage is open,

said valve means having a part on the side of the piston toward said one end of the cylinder which is arrested as the piston completes a stroke toward said one end of the cylinder to effect relative movement of the piston and valve means to said second position of the valve means and having a part on the other side of the piston which is arrested as the piston completes a stroke toward the other end of the cylinder to effect relative movement of the piston and the valve means to said first position of the valve means, and

a snap-acting overcentering spring means interposed between the piston and said valve means for snapping said valve means from its said first position to its said second position as the piston completes a stroke toward said one end of the cylinder, and for snapping said valve means from its said second position to its said first position as the piston completes a stroke toward said other end of the cylinder, the snap action of said valve means between its said first and second positions preventing stalling of the air motor as the piston completes its strokes,

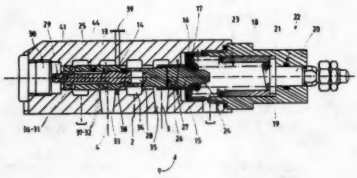
said spring means comprising a ring affixed to one of said valve means and piston and having a central opening therethrough generally coaxial with said cylinder, and spring finger means on the ring affixed to the other of said valve means and piston, said spring finger means being in substantial compression when in the plane of the ring whereby said spring finger means is adapted to snap through the plane of the ring from a coned position on one side of the ring to a coned position on the opposite side of the ring as the piston completes each stroke in the cylinder, the snap-action of said spring finger means exerting a force on said valve means sufficient to snap the valve means to its said first or second position.

4,879,944

HYDRAULIC CONTROL VALVE

Maurice Tardy, and Louis Marcon, both of Saint-Etienne, France, assignors to Bennes Marrel, Zone Industrielle Sud, Cedex, France

Filed Apr. 14, 1988, Ser. No. 181,690
Claims priority, application France, Apr. 23, 1987, 87 05965
Int. Cl.[4] F15B *11/00*
U.S. Cl. 91—516 **16 Claims**



1. A hydraulic power circuit comprising an hydraulic valve adapted to be connected between a pressurized fluid supply line and first and second lines feeding respective first and second circuits with different functions, said valve comprising:

a first fluid flow control member controlled by control means and connecting said supply line to said first circuit through said first line;

a two-position distributor device controlled by said control means and connecting said second line of said second circuit either to said supply line or to a return line,

a second fluid flow control member in said second line having an adjustable passageway adapted to respond to opposite actions from said control means and from back-pressure downstream in said second line, and comprising dashpot effect dampening means.

4,879,945

HYDRAULIC CONTROL DEVICE

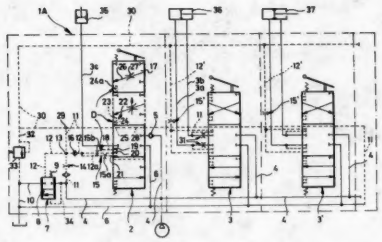
Rudolf Brunner, Baldham, and Heiner Fichtenbeiner, Gröbenzell, both of Fed. Rep. of Germany, assignors to Heilmeier & Wienlein, Fabrik fur Oel-Hydraulik GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,061

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722083

Int. Cl.[4] F15B *11/00*

U.S. Cl. 91—518 10 Claims



1. A hydraulic control device (1A, 1B, 1C) comprising at least one distributing valve (2, 2') connected upstream of a consuming point (35), whose control element (17, 17') locks at least one consumer line (3) in neutral position and connects the same in two control positions (a, b) alternatingly with a pump line (4) or a return line (6), a pressure source connected to the pump line (4), a pressure balance (7) connected to the pump line (4), a slide (8) loaded by a spring (9) in the direction to the locking position for the direct returning of the pressure medium conveyed by the pressure medium source (P) and not required by the consuming point (35) from the pump line (4) into the return line (6), a control line circuit branched off from the pump line (4) which has a first, a second and a third control line (11, 12, 34, 30), the first control line (11) leading from the pump line (4) to a relief connection, which is connected to the return line (6) in the neutral position of the distributing valve (2, 2'), while the second control line (12) leads from the spring side of the pressure balance (7) to at least one load pressure bleeding connection (20, 21) of the distributing valve (2, 2') and is connected to the first control line (119), the load pressure bleeding connection (20, 21) being connected to the consumer line (3c) in at least one control position (a) of the distributing valve (2, 2'), a first throttling point (14) disposed in the first control line (11) in the direction of flow to the distributing valve (2, 2') before the connection point (13) with the second control line (12), whose input pressure is transmitted via the third control line (34) to one side of the slide (8) of the pressure balance, and a second throttling point (15, 15') disposed in the second control line (12) behind the connection point (13), whose input pressure can be raised upon the adjustment of the control element (17, 17') from the neutral position and transmitted to the spring side of the slide (8) of the pressure balance (7) via the second control line (12), characterized in that the input pressure of the second throttling point (15) can be raised by means of the control element (17, 17') of the distributing valve (2, 2') as a function of its stroke in the direction to a control position end position prior to reaching the final position in at least two steps.

4,879,946

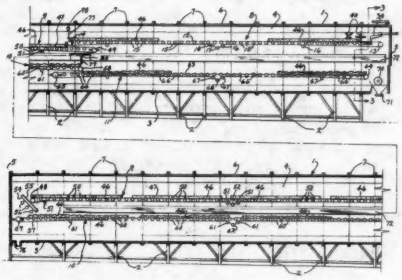
APPARATUS FOR MATTING AND MILLING OF CHEESE CURD

Frank W. Blodgett, and Paul R. Bokelmann, both of Fond du Lac, Wis., assignors to Damrow Company, Inc., Fond du Lac, Wis.

Filed Dec. 28, 1987, Ser. No. 138,552

Int. Cl.[4] A01J *25/00, 25/11*

U.S. Cl. 99—453 14 Claims



1. In a continuous cheese matting apparatus first conveyor means including a first porous conveying member and having an upstream end and a downstream end, feed means for feeding separate quantities of curds and whey to the upstream end of said first conveyor means to form a plurality of curd layers that are spaced along the length of said first conveyor means, each curd layer having a leading end and a trailing end, said whey draining through said first porous conveying member, second conveyor means including a second porous conveying member and having an upstream end disposed at a lower level than the downstream end of said first conveyor means and disposed to receive each curd layer from the downstream end of said first conveyor means, means responsive to the leading end of each curd layer approaching the downstream end of said first conveyor means for varying the speed of said first conveyor means to approximate the speed of said second conveyor means so that each curd layer is transferred from said first conveyor means to said second conveyor means while said first conveyor means and said second conveyor means are operating at approximately the same speed.

4,879,947

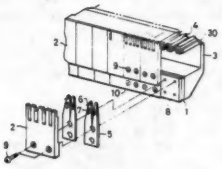
PRINTHEAD WHICH MINIMIZES STRAY MAGNETIC FLUX

Makoto Kurosawa, and Kenichi Igarashi, both of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 461,361, Jan. 27, 1983, abandoned. This application Nov. 16, 1987, Ser. No. 120,724

Int. Cl.[4] B41J *3/10*

U.S. Cl. 101—93.04 7 Claims



1. A printerhead comprising:

a common yoke;

a plurality of pole pieces extending from said common yoke, said pole pieces being divided into a first group of pole

pieces and a second group of pole pieces with the pole pieces in said first group alternating with the pole pieces of said second group;

a permanent magnet coupled to said common yoke at a position opposite said pole pieces, said permanent magnet establishing a magnetic field in each of said pole pieces;

a plurality of print hammers each having a first end rigidly coupled to said common yoke at a position adjacent said permanent magnet and a second end retractable against an end of a corresponding one of said pole pieces due to the magnetic field produced by said permanent magnet; and

driving means, comprising a plurality of release coils which are provided only around pole pieces of said first group, for driving only the print hammers corresponding to said first group of pole pieces by at least substantially cancelling the magnetic field in the pole pieces of said first group to accomplish printing of said characters, wherein the magnetic field in each of the pole pieces of said second group is maintained substantially constant during printing of characters except for minor variations due to stray magnetic flux created when said release coils are driven.

4,879,948

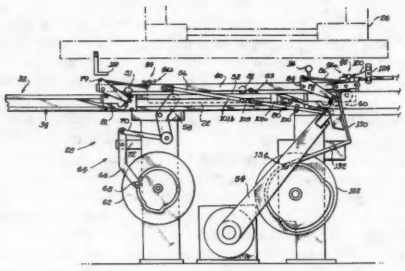
PRESS WITH AUTOMATIC SHEET TRANSPORT MECHANISM

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Oct. 4, 1988, Ser. No. 253,121

Int. Cl.[4] B41F *15/00*

U.S. Cl. 101—114 **12 Claims**



1. A printing press for use in printing on sheet stock comprising:

a frame;

a printing bed supported on said frame for supporting a sheet of stock, said printing bed being movable between an upper position for printing and a lower position, said printing bed having means to hold said sheet on said printing bed temporarily;

a print head supported on said frame for printing on said sheet;

means for transporting said sheet from an input station to the printing bed, comprising a gripper carriage and a plurality of forwardly opening grippers supported thereon, each said gripper having an upper jaw and a lower jaw and being movable between an open positon and a closed position;

said means for transporting said sheet further comprising means for translating and operating said grippers in a cycle in which said grippers (a) close upon a leading edge of a sheet of stock at a first position, (b) travel rearward, pulling said sheet to the printing bed, (c) open to release said sheet, then (d) travel forward to return to said first position;

means for moving said printing bed between its upper and lower positions in timed relation with travel of said gripper carriage such that said printing bed travels forward and downward from its upper position to remove said sheet from said grippers without interference between said sheet and said grippers after said grippers open to release said sheet.

4,879,949

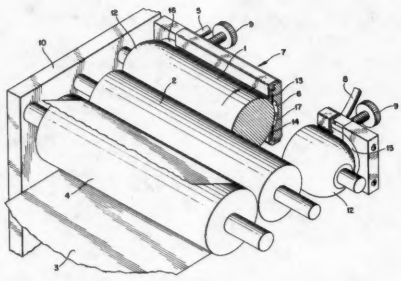
REVERSE ANGLE DOCTOR BLADE ASSEMBLY

Torben Vennike, Holsted, Denmark, assignor to Ildvaco Engineering A/S, Gesten, Denmark

Filed May 18, 1988, Ser. No. 195,154

Int. Cl.[4] B41F *9/10*

U.S. Cl. 101—157 **12 Claims**



1. A liquid transfer apparatus, comprising:

reservoir means defining a reservoir chamber for holding liquid;

transfer roll means having ends mounted for rotation about an axis which does not pass through said reservoir chamber, said transfer roll means having a transfer surface intermediate said ends for rotating to retain a metered quantity of said liquid;

means for engaging said transfer roll means so that said transfer surface faces said reservoir chamber and rotating said transfer roll means about said axis so that said transfer surface retains liquid from said reservoir chamber;

at least one doctor blade means having an edge for removing excess liquid adhering to said transfer surface as said transfer roll means rotates;

the improvement being:

that said transfer roll means, which have an ordinary cylindrical surface, are evenly terminated at each end with part of an ellipsoid face, and that said doctor blade means consists of two parallel parts which contact said cylindrical surface, and which are connected at each end with semi-elliptical doctor blade parts which contact the corresponding elliptical face of said transfer roll means.

4,879,950

IMAGE POSITION ADJUSTING APPARATUS OF ROTARY PRESS MACHINE

Koji Ishii, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 16, 1988, Ser. No. 207,559

Claims priority, application Japan, Jun. 19, 1987, 62-154039; Jul. 20, 1987, 62-181816

Int. Cl.[4] B41F *13/14, 13/20*

U.S. Cl. 101—217 **10 Claims**

1. In an apparatus for adjusting a position of an image to be printed by a rotary printing machine in first and second directions, the printing machine having a printing cylinder, a shaft, a frame defining an inside and an outside, the printing cylinder being disposed on the inside, a bevel gear associated with the printing cylinder, and a rubber cylinder with a bevel gear for

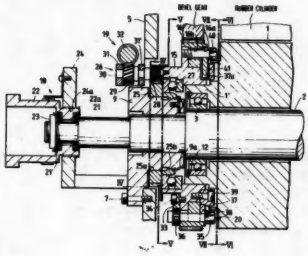
engagement with said printing cylinder bevel gear, the improvement wherein the apparatus comprises:

a plurality of first bearing means, supported on the frame, for supporting the shaft for axial movement in the second direction, the shaft having an end portion extending through the frame to the outside thereof, wherein the shaft is provided for supporting the printing cylinder for rotation;

second bearing means for supporting the printing cylinder for rotation relative to the shaft, and for axial movement in response to axial movement of the shaft;

a first handle mounted on the end portion of the shaft;

first translating means for translating rotation of the handle into axial movement of the shaft, the first translating



means including a first holder mounted outside the frame and in fixed relation to the frame;

a first gear rotatably mounted outside the frame;

second translating means for translating rotation of the first gear into axial movement of the printing cylinder bevel gear; and

supporting means for rotatably and slidably supporting the printing cylinder bevel gear on the printing cylinder such that axial movement of the printing cylinder bevel gear causes relative rotation between the printing cylinder bevel gear and the rubber cylinder bevel gear which causes relative rotation between the printing cylinder and the rubber cylinder for adjusting the printing of the image in the first direction.

4,879,951

INK SUPPLYING DEVICE

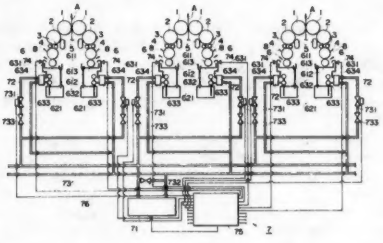
Kouichi Yoshida, Machida, and Noritake Harada, Kanagawa, both of Japan, assignors to Kabushikigaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,771

Claims priority, application Japan, Oct. 28, 1987, 62-272816

Int. Cl.[4] B41F *31/08*

U.S. Cl. 101—363 **11 Claims**



1. An ink supplying device comprising:

an inking cylinder;

means for feeding ink to said inking cylinder;

said ink feeding means comprising an ink reservoir, an ink feeding unit and means for circulating ink between the ink feeding unit and ink reservoir;

means for controlling the temperature of the ink to be fed into the inking cylinder, comprising a medium circulation unit including a medium chamber, a medium temperature detecting unit, a heater, and a cooler; a plate-type heat exchanger; means for circulating between the medium circulation unit and the heat exchanger; an ink temperature detecting unit; and a control unit for controlling the operations of the medium circulation unit to keep the temperature of the ink within a predetermined optimum range.

4,879,952

PRIMER

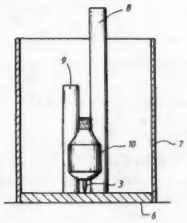
Richard Dowing; Jolanta Paull, and David Vince, all of Victoria, Australia, assignors to ICI Australia Operations Proprietary Ltd., Melbourne, Australia

Filed Jan. 20, 1988, Ser. No. 146,127

Claims priority, application Australia, Jan. 30, 1987, PI0122

Int. Cl.[4] F42B *3/10*; F42D *1/08*; C06C *5/04*

U.S. Cl. 102—331 **9 Claims**



1. A primer for an explosive charge, adapted to be fired by a detonating cord, the primer comprising a charge of explosive substantially completely surrounding a sensitising charge of high explosive, the sensitising charge being enclosed within an impermeable rigid container whose external shape includes a groove extending the length of the container to receive and at least partially surround the circumference of the detonating cord.

4,879,953

BULLET

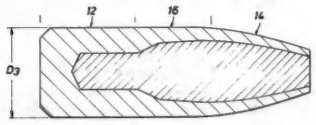
Herman L. Carter, P.O. Box 262348, Houston, Tex. 77207

Division of Ser. No. 11,582, Feb. 6, 1987, Pat. No. 4,793,037.

This application Oct. 24, 1988, Ser. No. 261,755

Int. Cl.[4] F42B *11/10*

U.S. Cl. 102—507 **11 Claims**



1. A bullet comprising an outer jacket of copper base material and an inner core lead bonded to the jacket, said jacket including a base portion and an ogived shaped nose portion having a wall that decreases in thickness away from the base portion, said base portion having a tensile strength sufficiently higher than the nose portion for the base portion to remain

intact after impact with a target while the nose portion splits longitudinally and expands as the bullet travels into the target with a minimum in weight reduction.

4,879,954

FOLDABLE TABLE

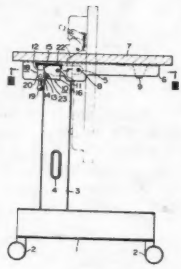
Masahiko Sawamura, 481 Sashima, and Kouji Takahashi, 192 Ashina, both of Yokosuka, Kanagawa-ken, Japan

Filed Feb. 1, 1983, Ser. No. 462,770

Claims priority, application Japan, Jan. 2, 1982, 57-12796[U]

Int. Cl.[4] A47B *3/00*

U.S. Cl. 108—6 **9 Claims**



1. A support surface movable between two positions, comprising:

means for movably supporting said support surface between two positions;

an engagement pin fixedly mounted upon said means supporting said support surface;

a first latching member pivotably mounted upon said support surface, and including first and second notched portions, said first notched portion being engageable with said engagement pin so as to retain said support surface in a first one of said two positions;

a second latching member, fixedly secured directly upon a shaft rotatably mounted within said support surface, having a projection engageable with said second notched portion of said first latching member whereby said second latching member is disposed in a locked position so as to retain said first latching member in engagement with said engagement pin;

spring-biasing means for interconnecting said first and second latching members together; and

manually accessible lever means, fixedly connected directly to said shaft upon which said second latching member is fixedly secured, for rotating said shaft and said second latching member from said locked position to a release position so as to permit said first latching member to be disengaged from said engagement pin under the influence of said spring-biasing means whereby said support surface is able to be moved from said first one of said two positions to a second one of said two positions.

4,879,955

OFFICE WORKSTATION

Reiner Moll, Schwaeb.Gmuend-Lindach, and Andreas Utz, Spraitbach, both of Fed. Rep. of Germany, assignors to Planmoebel Eggersman GmbH & Co. KG, Espelkamp, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,507

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720639

Int. Cl.[4] A47B *17/00*

U.S. Cl. 108—50 **28 Claims**

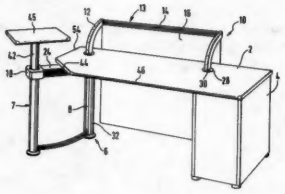
1. An office workstation comprising:

a lower frame including a plurality of vertically oriented legs;

a plurality of hollow joint bodies supported on said legs at upper ends thereof;

a plurality of hollow beams connected between said hollow joint bodies;

a table top vertically adjustably supported by said lower frame, said table top having at least one corner having an edge extending obliquely to an adjacent edge, and



wherein one of said plurality of hollow beams extends substantially perpendicularly away from and beyond said oblique edge;

an upper frame supported by said lower frame and including a horizontal carrier mounted between a pair of substantially vertical supports extending through said table top; and

wherein said legs, said joint bodies, said hollow beams and said upper frame include through openings for passage of cables.

4,879,956

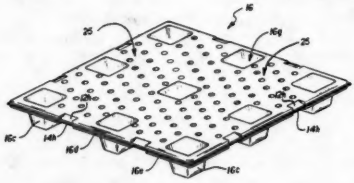
PLASTIC PALLET

Lyle H. Shuert, 817 N. Fieldstone, Rochester, Mich. 48063

Filed Jan. 14, 1988, Ser. No. 144,419

Int. Cl.[4] B65D *19/38*

U.S. Cl. 108—53.3 **11 Claims**



1. A plastic pallet comprising:

(A) an upper generally flat polygonal plastic sheet having an upper surface and having a series of downwardly extending hollow upwardly opening protuberances each opening in said upper surface of said sheet and having a bottom wall portion;

(B) a lower generally flat polygonal plastic sheet having a series of upwardly extending hollow downwardly opening protuberances generally corresponding in size, number, shape and distribution pattern to said downwardly extending protuberances and each having a top wall portion;

(C) said bottom wall portion of each downwardly extending protuberance being fused to said top wall portion of the respective upwardly extending protuberance to form integral solid wall portions at the interface of each downwardly and upwardly extending set of protuberances so as to position said sheets in fixed parallel spaced relation to each other to define a substantially planar polygonal load bearing platform structure, said load bearing structure having an upper face;

(D) said pallet further including a plurality of legs spaced circumferentially about the periphery of said load bearing member and depending downwardly from said load bearing platform structure to elevate said platform structure above a support surface by a distance to allow the entry of forklifts;

(E) each of said legs being formed of a downwardly extending portion of each of said sheets and forming an upwardly opening pocket opening in the upper face of said load bearing member structure to allow nesting of said pallet with other pallets of similar construction;

(F) said protuberances comprising bosses having generally cylindrical side walls so as to each coact with the matching boss to form a generally cylindrical column extending vertically between said upper and lower sheets;

(G) said bosses being arranged in generally parallel rows on each sheet with each row, except where interrupted by said pockets, extending from a location proximate a first edge of said platform structure to a location proximate a second edge of said platform structure opposite said first edge;

(H) said bosses being substantially equally spaced along each row for the entire length of each row;

(I) said rows being substantially equally spaced and extending from a first row proximate a third edge of said platform structure to a final row proximate a fourth edge of said platform structure opposite said third edge;

(J) the distance between successive bosses in each row and the distance between adjacent rows being selected to provide a plurality of bosses between adjacent pocket openings as measured between said first and second edges as well as measured between said third and fourth edges so as to form a series of tightly spaced columns between said sheets in all major areas of said platform structure not occupied by said legs.

4,879,957

IMPACT-IMPEDING PANE/FRAME STRUCTURE

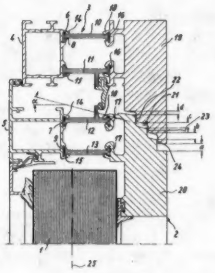
Siegfried Habicht, Leopoldshöhe; Rainer Reppert, and Eitel-Friedrich Höcker, both of Bielefeld, all of Fed. Rep. of Germany, assignors to Schuco International GmbH & Co., Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,637

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624849

Int. Cl.[4] E06B *05/10*

U.S. Cl. 109—79 **2 Claims**



1. An impact-impeding structure, comprising

(a) a pane arranged in a plane and having front and rear sides;

(b) impact-impeding frame means for supporting said pane, said frame means including

(1) an outer frame including a first longitudinal impact-impeding section arranged on at least one side of said pane; and

(2) an inner frame arranged within said outer frame and including a second longitudinal impact-impeding section arranged on said one side of said pane coplanar with said first impact-impeding section, said first and second impact-impeding sections each having a continuous stepped profile comprising a plurality of steps, each step including lateral and longitudinal portions, said profiles being arranged opposite each other and having corresponding configurations to define a labyrinthine gap therebetween, said gap having a longitudinal width defined between corresponding lateral step portions of said sections which decreases in the direction toward said plane, whereby when a projectile penetrates said gap, the projectile is deflected through the gap to deplete the kinetic energy of the projectile and minimize the risk of the projectile damaging said pane.

4,879,958

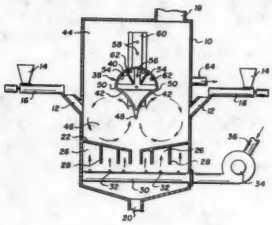
FLUIDIZED BED REACTOR WITH TWO ZONE COMBUSTION

John V. Allen, 1554 Matthews, Vancouver V6J 2S9; Berend Put, 4660 Pheasant Place, North Vancouver V7R 4C3, and Geoff W. Boraston, 1104 - 1265 Burnaby Street, Vancouver V6E 1P8, all of Canada

Filed Dec. 19, 1988, Ser. No. 286,134

Int. Cl.[4] F23G *5/00, 7/00*

U.S. Cl. 110—245 **9 Claims**



1. In a fluidized bed thermal reactor comprising:

a main housing including:

a waste inlet;

an exhaust gas outlet;

an incombustible solids outlets; a base member;

a fluidizable medium located on the base member;

a plurality of gas inlets in the base member whereby a fluidizing medium located on the base member may be fluidized;

the improvement comprising a hollow body of generally triangular cross-section extending across the main housing and dividing the housing into upper and lower zones and having a pair of arcuate deflector surfaces;

a gas inlet into the body whereby gas may be fed to the interior of the body;

a plurality of openings in the top of the body whereby gas fed to the body through the gas inlets heated in the body may rise upwardly in the upper zone to assist in combustion in that upper zone.

4,879,959

SWIRL COMBUSTION APPARATUS

Jacob Korenberg, York, Pa., assignor to Donlee Technologies, Inc., York, Pa.

Filed Nov. 10, 1987, Ser. No. 118,933

Int. Cl.[4] F23D *1/02*

U.S. Cl. 110—264 **27 Claims**

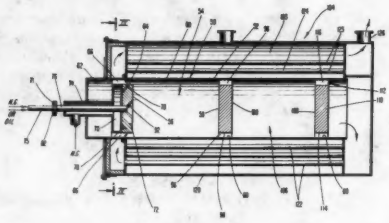
1. A swirl combustion apparatus, comprising:

a combustion chamber having a front end, a rear end and a

longitudinally extending substantially cylindrical wall having an inner surface;

means for supplying a peripheral swirl of air into the combustion chamber adjacent the inner surface of the cylindrical combustion chamber wall;

means for supplying fuel into the combustion chamber for mixing with the swirl of air and burning in the combustion chamber to form swirling hot combustion gases in the combustion chamber; and



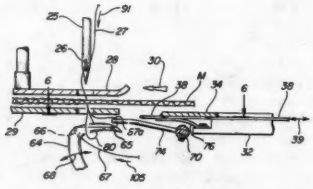
means for directing the swirling hot combustion gases out of the combustion chamber in a direction substantially tangential to the inner surface of the cylindrical combustion chamber wall, said directing means including a combustion chamber rear end wall having an annular combustion chamber outlet for directing the swirling hot combustion gases out of the combustion chamber, the annular combustion chamber outlet having an outer cylindrical outlet wall with a diameter substantially equal to the diameter of the inner surface of the cylindrical combustion chamber wall.

4,879,960

THREAD TRIMMER SYSTEM FOR IN-LINE CHAIN STITCH SEWING MACHINE

Eugene R. Prais, Hewitt, N.J., assignor to Kansai Special USA Corp., Moonachie, N.J.

Filed Jul. 22, 1988, Ser. No. 223,119
Int. Cl.[4] D05B *57/04, 65/02*
U.S. Cl. 112—291 **11 Claims**



1. Apparatus for severing the needle and looper threads of a chain stitch formed in a piece of material by a sewing machine having a needle plate, a needle carrying the needle thread through the material and the needle plate to form a needle loop of needle thread therebelow having a needle side running to the needle, a looper carrying the looper thread through the needle loop, and a spreader receiving the looper thread from the looper, said apparatus comprising:

a stationary knife positioned below the needle plate and having an edge against which the needle and looper threads are severed;

a spring positioned below said stationary knife and biased in a direction toward said stationary knife;

a movable knife slidably mounted between said stationary knife and said spring yieldingly urging said movable knife thereagainst and having one penetrating end with a pair of axially offset barbs, a lagging barb and a leading barb closer to said penetrating end of said movable knife than said lagging barb; and

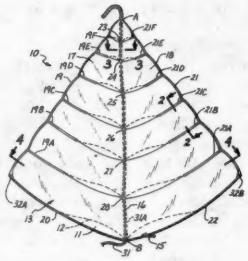
actuating means, connected to the other end of said movable knife, for extending said penetrating end through the needle loop so that said leading barb hooks the needle side of the needle loop and said lagging barb hooks the looper thread and retracting said penetrating end far enough beyond said edge of said stationary knife to sever the needle and looper threads carried by said barbs.

4,879,961

SAIL AIRFOIL DEVICE

Angel R. Aguilera, P.O. Box 1336, Crestline, Calif. 92325

Continuation-in-part of Ser. No. 228,007, Aug. 3, 1988, abandoned. This application Nov. 15, 1988, Ser. No. 271,605
Int. Cl.[4] B63H *9/06*
U.S. Cl. 114—102 **20 Claims**



1. An airfoil device, comprising:

an inflatable structure for attachment to an existing sail to form a sail assembly, the inflatable structure being dimensioned and arranged to extend over a substantial portion of the existing sail; and

valve means for enabling a user to inflate and deflate the inflatable structure while the inflatable structure is so attached to thereby vary the shape of the sail assembly;

the inflatable structure including inner and outer layers that define an enclosed interior suitable for containing a pressurized gas for inflation purposes;

which inner and outer layers are dimensioned and arranged to provide an airfoil shape to the sail assembly when the inflatable structure is inflated;

wherein the airfoil device includes means for attaching the inflatable structure to the existing sail, the means for attaching includes means for attaching the inflatable structure to the existing sail removably, and the means for attaching the inflatable structure to the existing sail removably includes a hook-and-loop type fastener attached to the inflatable structure and reinforced loops of a head portion, foot portion, and clews of the inflatable structure.

4,879,962

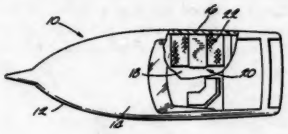
CONVERTIBLE DINETTE/SLEEPER FOR RECREATIONAL BOAT

Michael W. Lathers, Metamora, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 8, 1988, Ser. No. 216,797
Int. Cl.[4] B63B *29/04*
U.S. Cl. 114—188 **18 Claims**

18. A table apparatus comprising a base, a table portion having a generally planar upper surface, a first support member extending generally perpendicularly to said table portion and having an upper end fixedly secured to said table portion, and a lower end, and a second support member having an upper end connected to said lower end of said first support

member for pivotal movement about a first generally horizontal axis, and a lower end connected to said base for pivotal movement about a second axis generally parallel to said first axis, said first and second members being movable between a first position wherein said first and second support members are end-to-end, wherein said second support member extends



upwardly from said second axis, and wherein said first support member extends upwardly from said first axis, and a second position wherein said first and second support members are side-by-side, wherein said second support member extends downwardly from said second axis, and wherein said first support member extends upwardly from said first axis.

4,879,963

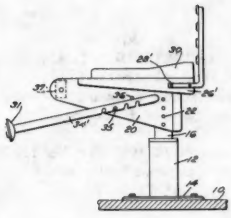
FISHING SEAT

Roland A. Dionne, Warwick, R.I., assignor to Robert N. Belivеau, Warwick, R.I.

Continuation-in-part of Ser. No. 160,760, Feb. 26, 1988, abandoned. This application Jan. 9, 1989, Ser. No. 294,310

Int. Cl.[4] B63B *29/00*

U.S. Cl. 114—363 **6 Claims**



1. A sport fishing seat comprising a pedestal adapted for mounting on the decking stucture of a boat, a long and narrow saddle seat having a cushioned upper surface defining a seat platform and side walls, means supporting the saddle seat from the pedestal, a foot rest assembly supported by said pedestal and having foot pedal tread plates extending laterally outward from one end thereof remote from the pedestal and a butt holder for a fishing pole mounted on said seat platform, said seat platform having a narrow width whereby a fisherman's legs closely straddle the said side walls of the seat.

4,879,964

AIR BRAKE ADJUSTMENT MARKER

Donald L. Emerson, Jr., 24805 SW. Gage Rd., Wilsonville, Oreg. 97070

Filed Sep. 12, 1988, Ser. No. 242,659

Int. Cl.[4] B60Q *11/00*; F16D *66/02*

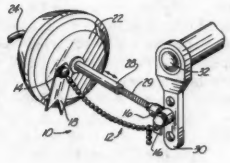
U.S. Cl. 116—28 R **18 Claims**

9. An air brake adjustment marker for use on a vehicle having an air brake system attached to the undercarriage of said vehicle, said air brake system including an air supply, an air canister operably connected to the air supply and attached to the undercarriage such that it is stationary with respect thereto, said air brake system further including a push rod extending from said air canister and movable from a retracted position to a first extended position and to a second over-extended position, and a braking mechanism operably connected to and movable by said push rod, the improvement comprising:

an adjustable length flexible member having two ends, said flexible member having a predetermined adjusted length corresponding to said first extended position;

a reusable, releasable securement means attached at an attachment point and interconnecting one end of said flexible member and one of said air canister or said push rod;

a clamp interconnecting the other end of said flexible member and the other of said air canister or said push rod;



said clamp having adjustment means to permit adjustment of the length of said flexible member; and

an indicator flag attached to said flexible member near said releasable securement means, whereby when said push rod is in its second over-extended position, said releasable securement means will release from said attachment point and drop downwardly allowing said indicator flag to drop by gravity and alert an operator of said vehicle that said air brake system requires attention.

4,879,965

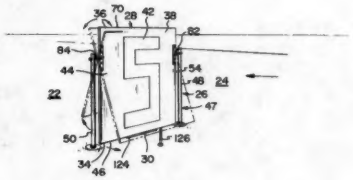
AIRPORT TWENTY-FOUR HOUR PILOT INFORMATION MARKERS

Irvin L. Valley, 1580 Weathervane Dr., Fircrest, Wash. 98466

Filed May 31, 1984, Ser. No. 616,266

Int. Cl.[4] G09F *7/00, 13/00*

U.S. Cl. 116—209 **6 Claims**



1. An airport twenty-four hour pilot information marker, comprising:

(a) a rectangular planar panel means having reflective material on each side arranged in contrasting reflective patterns to create pilot informative indicia;

(b) an overall mounting assembly to pivotally support the panel means above the ground, whereby the panel means may deflect when the wind blows, and yet be positioned at all times to reflect airplane landing light energy, thereby to inform the pilot of indicia information, which is of value to him or to her, when he or she is maneuvering an airplane around an airport, having

right and left pivotal assemblies attached to the rectangular planar panel means at opposite edges thereof, at locations below the top of this panel means, to thereby locate a smaller area of this panel means above these pivotal assemblies, and a larger area of this panel means below these pivotal assemblies, with each of these pivotal assemblies having:

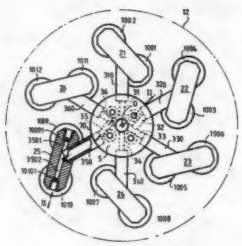
(1) an axis bolt rotatably supported in a respective support assembly;
(2) a fastener means to hold the axis bolt in place;
(3) an elongated bar secured to the axis bolt and fitted to the panel means;
(4) a fastener means to hold the panel means against the elongated bar; and
right and left support assemblies pivotally receiving near their tops the respective axis bolts, with each of these support assemblies having;
(1) a base pipe for placement in the ground;
(2) a standing pipe for partial telescoping insertion into the base pipe and supporting a pivotal assembly;
(3) a positioning means to hold the standing pipe in a selected inserted position within the base pipe;
(4) a transverse cross stop pin selectively placed in this base pipe to hold this base pipe in a relative depth position in the ground;
(5) concrete poured about the lower portions of this base pipe and completely about this transverse cross stop pin;
(6) a transverse fastener assembly to selectively position this standing pipe down into this base pipe; and
(7) sealing caps for the top of this standing pipe and for the bottom o this base pipe to keep their interiors cleaner and drier.

4,879,966

UNDERWATER PAINTING MACHINE COMPRISING A PAINT APPLICATION DEVICE WITH PULSATORY MOVEMENT ASSOCIATED WITH A ROTARY SMOOTHING DEVICE

Eugene Gourronc, Kerivoret Porspoder, France, assignor to Jean Simon, Borgo, France

Filed Jun. 30, 1986, Ser. No. 880,368
Claims priority, application France, Apr. 22, 1986, 86 05766
Int. Cl.[4] B05C *1/00*
U.S. Cl. 118—207 **9 Claims**



1. An underwater painting machine comprising : a paint application brush and a smoothing brush mounted on a common frame for simultaneous translation along the submerged surface to be treated, said smoothing brush having an active end surface which continuously engages said submerged surhollow shaft.

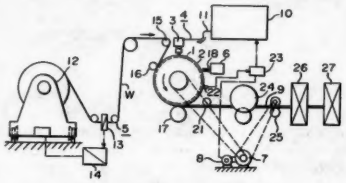
4,879,967

SEPARATOR MANUFACTURING APPARATUS FOR FORMING A SEPARATOR PLATE HAVING RIBS OF RESINOUS MATERIAL ON A BASE SHEET

Yukinori Sengoku, Nakatsugawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,463
Claims priority, application Japan, Oct. 1, 1987, 62-248412
Int. Cl.[4] B05C *1/08*
U.S. Cl. 118—259 **7 Claims**

1. A separator manufacturing apparatus for forming a separator plate having ribs of resinous material on a base sheet, which comprises:
a transfer roller with a plurality of annular shaping grooves having a predetermined shape corresponding in cross section to the ribs, said ribs being formed in the outer circumferential surface of said roller and extending in its circumferential direction,
a resin feeding device with a nozzle means having a plurality of nozzles positioned to separately feed a hot-melt type resin having highly adhesive properties to each of said annular shaping grooves of the transfer roller,



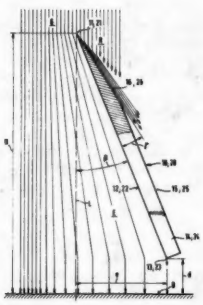
a base paper feeding device to feed a continuous base paper at a predetermined speed to a part of said outer circumferential surface of the transfer roller at the time of feeding said resin to thereby form by transfer a plurality of said ribs having a predetermined shape corresponding to the annular shaping groove on a surface of said continuous base paper, and
a parting agent coating device for applying before the feeding of said resin a thin layer of parting agent to at least a portion of said annular shaping grooves on said transfer roller.

4,879,968

SEPARATING DEVICE FOR TRIMMING THE WIDTH OF A POURED CURTAIN OF COATING MATERIAL

Martin Denz, and Diethard Kapp-Schwoerer, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 24, 1988, Ser. No. 159,982
Claims priority, application Switzerland, Mar. 3, 1987, 792/87
Int. Cl.[4] B05D *1/30*
U.S. Cl. 118—300 **9 Claims**



1. In a coating apparatus for pouring a curtain of coating material moving downwardly on to a substrate, moving transverse to the direction of movement of the curtain, and impinging on the substrate in a coating plane, with said curtain forming a coating layer, on said substrate, having marginal beads formed therein parallel with the direction of movement of said substrate, and a severing organ associated with at least one side of said curtain and having a foot end and an upper end thereof and being inclined with regard to the perpendicular with said

foot end farther from the central region of said curtain than said upper end, said severing organ being adapted to trim the width of said curtain prior to the impingement thereof on said substrate in said coating plane extending at a short distance below said foot end, said upper severing organ end protruding into said curtain in a manner such that a marginal region of said curtain is severed from said central region thereof, and a cut-off portion of coating material constituting said marginal region is diverted laterally while the trimmed central region of said curtain adheres over a part of its downward travel to said severing organ thereby being spread and downwardly widened prior to impinging on said substrate, the improvement of said severing organ consisting essentially of a one-piece separating element comprising

- an upper end being designed as a knifelike, sharp severing edge,
- said foot end having a lower foot-end edge when said separating element is in said inclined condition,
- an inner wall surface destined for facing toward said central curtain region and having a smooth, uninterrupted face extending in only one plane from said severing edge to said lower foot end edge at said foot end,
- a rear wall surface facing away from said central curtain region having an oblique face provided at the upper end thereof and enclosing with said smooth inner wall surface an acute angle, thereby rendering said upper severing edge knifelike sharp,

the inclination of said separating element relative to the perpendicular being adjustable in a manner such that the trimmed central region of said curtain moves downward with laminar flow and with lateral spreading along said inner wall surface and is detached from said inner wall surface at said lower foot end edge and impinges on said substrate with almost the same lateral spreading as produced at said lower foot-end edge, whereby a coating deposited on a substrate by the curtain impinging thereon has formed therein only a naroow marginal bead being at most twice as high as the deposited, still undried coating layer.

4,879,969

ELECTROSTATIC FLOCKING APPARATUS

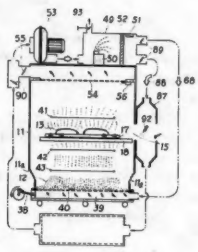
Tomoji Haranoya; Toshio Motegi, both of Ashikaga, and Masaaki Abe, Ohmiya, all of Japan, assignors to Toyo Flocking Co., Tochigi and Mesac Corporation, Tokyo, both of, Japan

Filed Jul. 17, 1987, Ser. No. 74,986

Claims priority, application Japan, Jul. 28, 1986, 61-177465; Sep. 5, 1986, 61-208032

Int. Cl.[4] B05B *5/00*

U.S. Cl. 118—638 **7 Claims**



1. An electrostatic flocking apparatus comprising:

a flocking chamber;

flock support means disposed at the bottom of said flocking chamber for supporting flock within said flocking chamber,

said flock support means comprising a box, a perforated board or mesh screen defining an upper surface of the box for supporting flock, and vibratory or rocking means operatively connected to said box for vibrating or rocking said box to separate mass or masses of flock supported on the upper surface of said box into discrete fibers;

an air blow producing means for forcing a stream of air upwardly through said upper surface of said box that blows the discrete fibers supported on said upper surface upwardly in said flocking chamber;

filter means disposed at an upper portion of said flocking chamber for allowing the stream of air to discharge therethrough and for preventing the fibers blown by the stream of air to discharge therethrough;

a first electrode disposed between the upper surface of said box and said filter means;

a second electrode disposed between said first electrode and the upper surface of said box;

a third electrode disposed between said second electrode and the upper surface of said box for polarizing the discrete fibers as they are blown upwardly in said flocking chamber by the stream of air;

three power source means electrically connected to said first, second and third electrodes, respectively for impressing respective voltages on said electrodes,

the power source means of at least one of said first and said second electrodes including a polarity changeover means for changing the polarity of the voltage of the electrode to which said power source means including the polarity changeover means is electrically connected; and

workpiece support means within said flocking chamber for supporting a workpiece to be flocked between said first and said second electrodes.

4,879,970

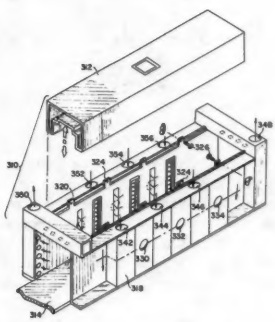
COATING HOOD FOR APPLYING COATING COMPOUND ON CONTAINERS

Raymond W. Barkalow, Jackson; Harold S. Dick, Watchung, both of N.J., and Roger T. Guthrie, Spartanburg, S.C., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Apr. 21, 1987, Ser. No. 41,024

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—719 **6 Claims**



1. A coating hood for applying uniform protective coatings to glass containers, said coating hood comprising:

(a) a pair of spaced side walls defining as space through which said containers pass from the entrance opening to an exit opening;

(b) coating air supply means defined in at least one side wall for supplying process air comprised of a coating compound entrained in a gas, to said containers;

(c) exhaust means defined in at least one side wall for receiving an output from said space; and

(d) means for introducing the coating compound to said coating air supply means;

(e) means for substantially diluting a film of said compound surrounding and traveling said containers to prevent escape of said coating compound through said exit opening.

4,879,971

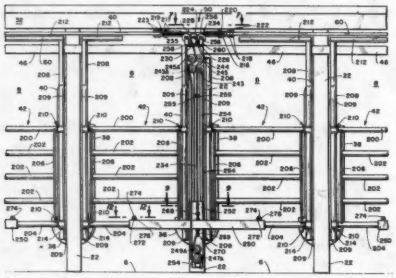
CONTROLLED LIFT GATE SYSTEM FOR MILKING PARLORS

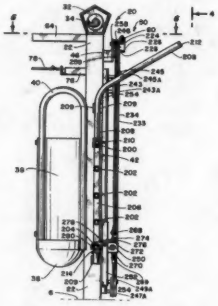
August Vandenberg, 1904 Trotter Trail, Norco, Calif. 91760; Ben W. Vandenberg, 17224 Gard Ave., Artesia, Calif. 90701; Andrew W. Vanderberg, 15751 Ryon St., and Ben E. Haws, 8828 Laurel St., both of Bellflower, Calif. 90706

Filed Jun. 9, 1988, Ser. No. 204,395

Int. Cl.[4] A01K *1/12*

U.S. Cl. 119—14.03 **15 Claims**





1. An improved exit gate for milking parlors, comprising:

at least one cattle station having at least one generally rectangular vertical member and a box beam secured adjacent the upper end of said vertical member and extending horizontally therefrom;

a gate pivotally secured to said vertical member for vertical movement between a raised open position and a lowered closed position;

first movement means for moving said gate connected to said gate and actuable to raise said gate, including an air cylinder mounted on said box beam, a draw-rod movable by said air cylinder between an extended and a retracted position, a traveling pulley carried by said draw-rod, a first cable having one end secured in a fixed position and passing about said traveling pulley and having the opposite end of said first cable secured to said gate, whereby actuation of said air cylinder will retract said draw-rod and said traveling pulley and cause said first cable to raise said gate and

second movement means for moving said gate connected to said gate and actuable to lower said gate in a slow and controlled manner.

4,879,972

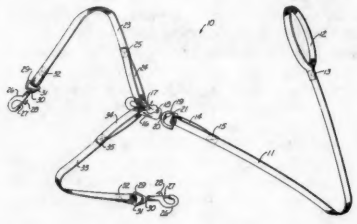
DOUBLE PET WALKER

Dennis E. Crowe, and Julie L. Crowe, both of 5004 SW. 6th, Des Moines, Iowa 50315

Continuation of Ser. No. 106,570, Oct. 9, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 233,898

Int. Cl.[4] A01K *27/00*

U.S. Cl. 119—109 **2 Claims**



1. A double pet walker consisting of:

a first flexible line, a first loop means for selectively receiving an adult human hand therethrough on one end thereof and a second loop means for selectively receiving an adult human hand therethrough on the other end thereof;

first swivel means attached to said second loop for preventing twisting of said first flexible line;

first snap fastener means attached to said swivel means for selectively receivingly holding flexible members, said snap fastener means including means for selectively opening or closing said snap fastener means;

a second flexible line, one end of said second flexible line having a third loop means thereon large enough to receive an adult human hand therethrough, said second flexible line being substantially shorter than said first flexible line, said first snap fastener means selectively enclosing said third loop means;

second swivel means attached to the other end of said second flexible line for preventing twisting of said second flexible line;

second snap fastener means attached to said second swivel means for selective attachment to pet collars;

a first pet collar attached to said second snap fastener means;

a third flexible line, one end of said third flexible line having a fourth loop means thereon large enough to receive an adult human hand therethrough, said third flexible line being substantially shorter than said first flexible line, said first snap fastener means selectively enclosing said fourth loop means; wherein, the length of said third flexible line and the length of said second flexible line are approximately the same;

third swivel means attached to the other end of said third flexible line for preventing twisting of said third flexible line;

third snap fastener means attached to said third swivel means for selective attachment to a pet collar; and

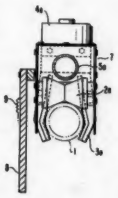
a second pet collar attached to said second snap fastener means whereby two pets can be taken for a walk without tangling of said first, second and third flexible lines.

4,879,973

AUTOMATIC TUBE CIRCUMFERENCE SCANNING APPARATUS

Takuzo Maeyama; Kenichi Nii; Shigeru Shimojo, all of Osaka; Keiichi Iwamoto; Masaaki Torichigai, both of Nagasaki, and Kiyoshi Koizumi, Tokyo, all of Japan, assignors to The Kansai Electric Power Co., Inc., Osaka and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 1, 1988, Ser. No. 214,641
Claims priority, application Japan, Jul. 7, 1987, 62-164770
Int. Cl.[4] F22B *37/42*
U.S. Cl. 122—379 2 Claims



1. An automatic tube circumference scanning apparatus comprising an upper support/traverse section mounted on an upper tube in a group of tubes arrayed as directed in the horizontal directions so as to be able to travel along a tube axis and to stop and grip said upper tube, a lower support/traverse section mounted on a lower tube appropriately separated from said upper tube so as to be able to travel, stop and grip said lower tube, a flexible rail extended vertically between said upper and lower support/traverse sections and fixed thereto, and a probe scanning section mounted on said rail so as to be able to move up and down, which grips any arbitrary tube between said upper and lower tubes for making a probe scan around the same tube.

4,879,974

CRANKCASE SUPERCHARGED 4 STROKE, 6 CYCLE ENGINE

Gary M. Alvers, 228 S. Jackson 2A, Red Bluff, Calif. 96080

Filed Mar. 14, 1988, Ser. No. 167,490
Int. Cl.[4] F02B *25/08*
U.S. Cl. 123—51 A 16 Claims

1. A high power, low-emission, fuel efficient, supercharged, four-stroke 6 cycle engine comprising:

means for defining a chamber having a cylindrical portion;

a piston which reciprocates in the cylindrical portion of the chamber through successive intake, compression, power and exhaust strokes respectively while six different cycles or events take place and divides the chamber into a combustion chamber and a compression chamber;

means for supplying air to the compression chamber during the compression and exhaust strokes of the piston;

a compression chamber inlet valve to prevent reverse flow back out of the compression chamber;

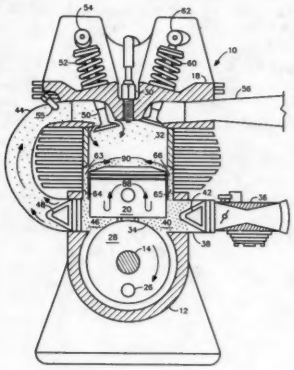
an intake conduit providing fluid communication between the compression chamber and the combustion chamber;

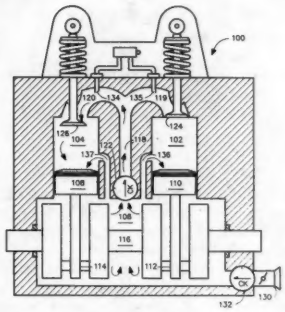
a compression chamber outlet valve interposed in the intake conduit proximate the compression chamber to prevent reverse flow from the intake conduit to the compression chamber but allows flow from the compression chamber into the intake conduit during the intake and power strokes of the piston;

an active intake valve operable to allow fluid communication from the intake conduit into the combustion chamber during the intake stroke of the piston;

means for mixing fuel with the air as it passes from the compression chamber to the combustion chamber through the intake conduit to provide a compressed combustible charge which is injected into the combustion chamber at greater than atmospheric pressure during the intake stroke of the piston; and

at least one secondary conduit providing fluid communication from the compression chamber to the interior of the combustion chamber through a secondary port located so that the port is blocked by the piston except near the bottom dead center position of the piston in order that





supplemental air is fed into the combustion chamber immediately above the piston at the end of the intake stroke and beginning of the compression stroke through the secondary port to provide a stratified charge in the combustion chamber, and further secondary air is fed into the combustion chamber at the end of the power stroke and beginning of the exhaust stroke to enhance complete combustion of combusted charge.

4,879,975

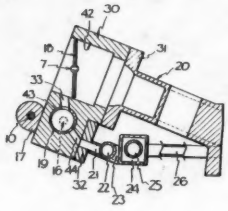
ALCOHOL FUEL OPERATION CONVERSION MEANS FOR INTERNAL COMBUSTION ENGINES

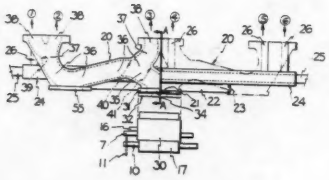
John R. McC. Bennett, Melbourne, Victoria, Australia, assignor to Bennett Automotive Technology Pty., Ltd., Victoria, Australia

PCT No. PCT/AU87/00142, § 371 Date Jan. 19, 1988, § 102(e) Date Jan. 19, 1988, PCT Pub. No. WO87/07332, PCT Pub. Date Dec. 3, 1987
PCT Filed May 21, 1987, Ser. No. 175,043
Int. Cl.[4] F02B *31/00*
U.S. Cl. 123—52 M 15 Claims

1. A carburetion and manifolding arrangement to allow the

efficient operation of a six-cylinder internal combustion engine on fuels having a high latent heat of vaporisation such as ethanol and methanol comprising a variable venturi type carburetion means, a first and larger inlet manifolding means to be used during medium to high power operation, and a second and smaller inlet manifolding means to be used during starting, idling and low power operation wherein the first and larger inlet manifolding means leads to a respective cylinder-head inlet port for each cylinder and is made with a circular central entry opening having a predetermined area, leading by branching to a separate runner of an internal rectangular cross-sectional shape for each cylinder, a smooth transition from circular to rectangular shape occurring between the entry opening and a branching point of the separate runners for cylinders 3





and 4, the height of the runners being constant throughout the first and larger manifolding means at 65% of the diameter of the entry opening and the width of the runners decreasing smoothly such that the cross-sectional area of the runners is 57% of the area of the entry opening at the branching point of the separate runners to cylinders 3 and 4, 51% of the area of the entry opening at a point mid-way between the branching point of the separate runners to cylinders 3 and 4 and a branching point of the separate runners to cylinders 1 and 2 and 5 and 6, 46% of the area of the entry opening at the branching point of the separate runners to cylinders 1 and 2 and 5 and 6, and 41% of the area of the entry opening at each point where the separate runners to all cylinders debouch into their respective cylinder head inlet ports.

4,879,976

REED VALVE MECHANISM FOR ENGINES

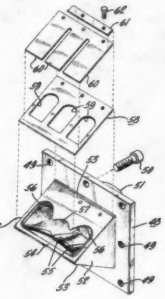
Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

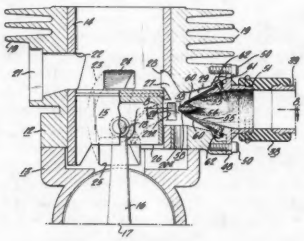
Filed Sep. 9, 1987, Ser. No. 94,548

Int. Cl.[4] F02B *75/02*

U.S. Cl. 123—651 **17 Claims**

1. Reed valve mechanism for use in a fuel/air supply passage of an internal combustion engine, comprising a V-shaped reed cage with its apex presented downstream of the direction of flow through the supply passage, the reed cage having converging side walls with valve ports therein communicating with the supply passage, the side walls having planar external surfaces meeting along the reed cage apex, and reed valves overlaying the valve ports on the downstream sides of the reed cage planar surfaces, the reed cage further having at least one end wall with an interior surface defining a portion of the supply passage and being of curvilinear aeroform contour with respect to the axis of flow through the supply passage to the valve ports, the curvilinear contour of which is substantially uninterrupted upstream from the valve surface of the reed





valve at least to the upstream edges of the reed valve cage, and the upstream portion of said curvilinear aeroform interior surface of said end wall being closer to the flow axis than the downstream portion of said end wall.

4,879,977

PRE-TIMED DISTRIBUTION UNIT, IN PARTICULAR FOR INTERNAL COMBUSTION ENGINES

Amedeo A. Restelli, Cernusco Lombardone, Italy, assignor to Societa Italiana Catene Calibrate Regina S.p.A., Milan, Italy

Filed Apr. 26, 1988, Ser. No. 186,241

Claims priority, application Italy, May 6, 1987, 20412 A/87

Int. Cl.[4] F01L *1/02*; F16H *7/06*

U.S. Cl. 123—90.31 **10 Claims**

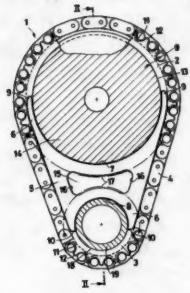
1. A pre-timed distribution unit for internal combustion engines, comprising:

a first driven sprocket wheel and a second driving sprocket wheel each having a plurality of sprocket sets;

a multiple-link chain means disposed about said two sprocket wheels;

at least one pair of adjacent sprocket sets on each sprocket wheel defining an annular space therebetween for receiving a contoured plate-shaped shoe means;

said guide shoe means extending in an inner space between said sprocket wheels;



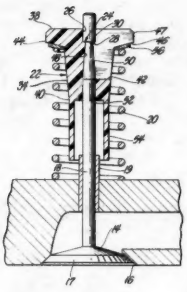
said guide shoe means being totally contained inside said inner space.

4,879,978

POPPET VALVE SPRING RETAINER

Daniel H. Pierce, 1330 Lyonhurst Rd., Birmingham, Mich. 48009

Filed Aug. 25, 1988, Ser. No. 236,553
Int. Cl.[4] F01L *3/10*
U.S. Cl. 123—90.67 **21 Claims**



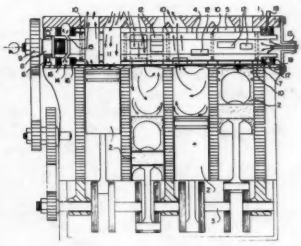
1. An engine apparatus including a spring retainer **(22)** of the type for retaining a return spring **(20)** on a stem **(18)** of a poppet valve **(14)**, said apparatus **(10)** comprising: a valve seat **(16)**; a valve guide **(19)**; a poppet valve **(14)** having a stem **(18)** slideably supported in said valve guide **(19)**; a return spring **(20)** associated with said stem **(18)** for urging said poppet valve **(14)** in a predetermined direction against said valve seat **(16)**; and one-piece retainer means **(22)** having an operational position on said stem **(18)** for retaining said return spring **(20)** on said poppet valve **(14)** and including a cylindrical bore **(26)** having a substantially uniform diameter surrounding said stem **(18)** when in said operational position, characterized by said retainer means **(22)** including integral self-locking means **(24)** for automatically locking said retainer means **(22)** on said stem **(18)** when said retainer means **(22)** is in said operational position, said self-locking means **(24)** extending radially inwardly from said bore **(26)**.

4,879,979

INTAKE AND EXHAUST SYSTEM THROUGH ROTATORY PORTS SHAFT, IN FOUR-STROKE MOTORS

Felix O. Triguero, Virgen de la Fuencisla 33, 28027 Madrid, Spain

Filed Mar. 29, 1988, Ser. No. 174,700
Claims priority, application Spain, Mar. 30, 1987, 8700897
Int. Cl.[4] F01L *7/00*
U.S. Cl. 123—190 BB **6 Claims**



1. An intake and exhaust system for use in four-stroke motors, said system comprising:

a rotatory ports shaft, said shaft being generally hollow but having ports therethrough, said shaft having a nipple at one end and inclined bores at the other end;

a jacket, said jacket having matching ports through its cross-section, said shaft being rotatably disposed in the jacket;

a gear disposed on an end of the shaft;

ball bearings supporting opposite ends of the shaft;

an annular chamber in fluid communication with a cooling system of said motor, said inclined bores adjoining said annular chamber; and

means for introducing water into the nipple so that the water flows through the shaft and then centrifugally enters the annular chamber through the inclined bores.

4,879,980

CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES

Diego Piazzo, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

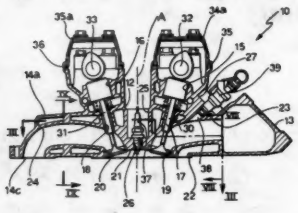
Filed Sep. 22, 1988, Ser. No. 247,561
Claims priority, application Italy, Sep. 23, 1987, 67808 A/87
Int. Cl.[4] F02F *1/47*
U.S. Cl. 123—193 H **7 Claims**

1. A cylinder head for internal combustion engines for motor vehicles, comprising a body produced by casting and defining, for each cylinder, a combustion chamber which communicates on opposite sides with an intake duct and an exhaust duct through passages defined by respective intake and exhaust valve seats, wherein:

the intake ducts and the exhaust ducts open into respective intake and exhaust manifolds which are formed integrally with the body of the head by casting,

the integral intake and exhaust manifolds can be removed

from the body of the head by milling, as a result of which the body is arranged for the fitting of added manifolds,



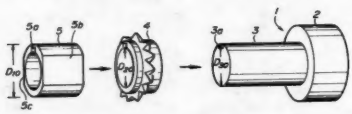
the body is arranged for the selective application of the fuel supply and ignition members typical of Otto-cycle or Diesel-cycle internal combustion engines respectively.

4,879,981

OIL PUMP DRIVING MECHANISM

Eiichi Matsumoto, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 31, 1988, Ser. No. 238,376
Claims priority, application Japan, Sep. 3, 1987, 62-135183
Int. Cl.[4] F02B 77/00
U.S. Cl. 123—198 C **15 Claims**



1. In an oil pump driving mechanism by which the rotation of a crankshaft of an engine is transmitted to an oil pump which is disposed about a leading end of said crankshaft with an annular input member of said oil pump concentrically disposed therebetween,

a cylindrical portion integrally defined by said leading end of the crankshaft, said cylindrical portion having the same diameter throughout the axial length thereof; and

a tubular spacer member coaxially disposed on and detachably connected to said cylindrical portion to rotate therewith, said tubular spacer member having such an external shape as to be latchingly engageable with said annular input member of said oil pump.

4,879,982

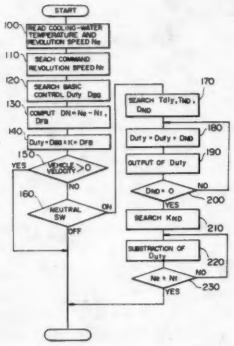
METHOD OF AND APPARATUS FOR CONTROLLING ENGINE REVOLUTION SPEED

Tomiya Itakura, and Hiroshi Kamifuji, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuda, both of, Japan

Filed Aug. 22, 1988, Ser. No. 234,936
Claims priority, application Japan, Aug. 28, 1987, 62-213106
Int. Cl.[4] F02D 41/08
U.S. Cl. 123—339 **2 Claims**

1. A method of controlling revolution speed of an engine for use in an automobile having an automatic transmission through which driving power is transmitted from an engine to driving wheels, said method employing an engine revolution speed controlling apparatus which includes, at least, an auxiliary air control valve for supplying auxiliary air by-passing a throttle valve, electromagnetic means for actuating said auxiliary air control valve, a sensor for detecting the revolution speed of said engine, and control means for controlling the flow rate of said auxiliary air through said auxiliary air control valve by varying the duty of said electromagnetic means in accordance with a signal from said sensor, said method comprising the steps of:

(a) effecting an increment of said duty of said electromagnetic means after a time (Tdly) upon receipt of a signal representing that the state of said transmission has been changed from the neutral state to a power transmitting state;



(b) maintaining the incremented state of duty for a period (T_{ND});

(c) reducing the duty at a rate (K_{ND}); and

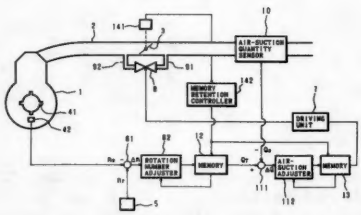
(d) delivering the delay time (Tdly), period (T_{ND}) and the rate (K_{ND}) as functions of the cooling water temperature on the basis of the temperature of the engine cooling water.

4,879,983

APPARATUS FOR CONTROLLING NUMBER OF ROTATION OF INTERNAL COMBUSTION ENGINE

Setsuhiro Shimomura, and Yukinobu Nishimura, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00499, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO88/00647, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 11, 1987, Ser. No. 196,118
Claims priority, application Japan, Jul. 14, 1986, 61-166196
Int. Cl.[4] F02D 41/16
U.S. Cl. 123—339 **2 Claims**



1. An apparatus for controlling the number of the rotation of an internal combustion engine comprising; a rotation-number adjuster which generates an objective air-suction quantity and an objective air-suction tube pressure of the engine in conjunction with the number of the rotation and an objective number of the rotation of the engine; an air-suction adjuster which generates adjustment signals in conjunction with the signal

output from said rotation-number adjuster and the air-suction quantity and air-suction tube pressure of the engine; an air-suction control valve which increases and decreases one of said air-suction quantity and air-suction tube pressure of the engine on receipt of a signal outputted from said air-suction adjuster; and means for retaining said air-suction quantity and the number of the rotation of the engine by stopping at least one of those operations executed by said rotation-number adjuster and said air-suction adjuster when the engine is not in idling condition.

4,879,984

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

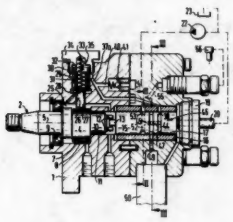
Helmut Rembold, Stuttgart; Ernst Linder, Muehlacker, and Gottlob Haag, Markgroningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,587

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3804025

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—450 **23 Claims**



1. An electrically controlled fuel injection pump operative for direct fuel injection in an internal combustion engine having externally supplied ignition, a drive shaft (2, 102), a drive cam (4, 7; 104) on said drive shaft, a plurality of cylinder bores (32), one each of a plurality of pump plungers (29) guided in one each of plurality of cylinder bores and driven at a constant stroke by said drive cam (4, 7; 104) said cam rotated by said drive shaft (2, 102) of said fuel injection pump, a pump work chamber in each of said pump plungers and said cylinder bores, a longitudinal bore in said fuel injection pump, a slide valve (46) in said longitudinal bore which is driven in synchronism with said drive shaft, said slide valve forming a rotationally driven distributor (15) including a recess (42) in its jacket face, a radial conduit (43) which extends from said recess to an axial conduit (44), means extending from said axial conduit which communicates during rotation with a distributor opening which aligns with a plurality of conduit segments (55) that extend through said injection pump and which connect one each with a pressure line to a fuel injection valve for each cylinder of said engine, a relief conduit (49) that extends from said axial conduit to an electrically controlled valve (50) which is connected to a low pressure chamber, a plurality of overflow conduits in said fuel injection pump, one each of said overflow conduits extending from one each of said work chambers (35), each of said overflow conduits extending to one each of conduit segments (37*a*–37*d*) in said cylinder line in planar alignment with said recess (42), said recess has a circumferential extent such that at least two of said conduit segments are connected with said recess at the same time during rotation of said slide valve, said electrically controlled valve (50) is controlled by a control circuit so that fuel pumped by each of said pump plungers and controlled by rotation of said slide valve is directed to each of said fuel injection valves while said electrically controlled valve is closed, and fuel is directed to said low pressure chamber during opening of said electrically controlled valve.

4,879,985

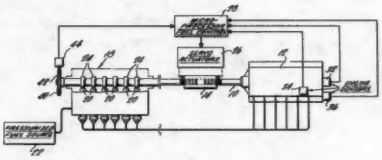
TIMING AND SPEED SENSOR FOR FUEL INJECTION PUMP

Eric Day, Longmeadow; Jean Paul Aubin, South Hadley, both of Mass., and Jan Peyrot, Glastonbury, Conn., assignors to AIL Corporation, Columbia, S.C.

Continuation of Ser. No. 106,973, Sep. 29, 1987, abandoned, which is a continuation of Ser. No. 796,058, Nov. 7, 1985, abandoned. This application Mar. 22, 1988, Ser. No. 175,685

Int. Cl.[4] F02M *59/20, 65/00*

U.S. Cl. 123—501 **3 Claims**



1. Apparatus comprising:

a first rotating member;

a second rotating member;

coupling means for driving said second rotating member in syntony with and at variable rotational angles with respect to said first rotating member;

first sensor means for producing reference pulses indicative of the times of occurrence of only one specific reference rotational position of said first rotating member;

wheel means synchronously driven by said second rotating member and having a plurality of tooth members evenly spaced about it;

second sensor means disposed adjacent said wheel means for producing a pulse for each occurrence of a juxtaposition one of said tooth members with said second sensor means;

means responsive to said pulse from said second sensor means for providing a speed signal indicative of the rotational speed of said second rotating member, in response to the frequency or time interval between said pulses;

means for producing a time-difference signal indicative of the timer interval between each pulse from said first sensor means and a next adjacent pulse from said second sensor means; and

means responsive to said speed signal and to said time-difference signal for producing a signal which is a function of the product of said rotational speed times said time interval, and indicative of the angle between said first and second rotating members.

4,879,986

MALFUNCTION DETECTION OF AN ENGINE EXHAUST GAS RECIRCULATION SYSTEM

Masanori Sakamoto, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,142

Claims priority, application Japan, Aug. 25, 1987, 62-212191

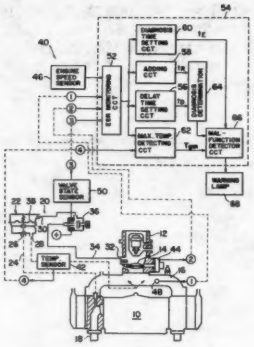
Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **6 Claims**

1. A method of detecting malfunctions in an exhaust gas recirculation system for an internal combustion engine, wherein exhaust gas recirculates only when a prescribed set of operating conditions of the engine are met, and wherein a temperature sensor is provided for sensing the temperature of the exhaust gas being recirculated, said method comprising the steps of:

(a) constantly monitoring the prescribed set of engine oper-

ating conditions for the commencement and progress of exhaust gas recirculation;
(b) setting up a prescribed length of delay time when the engine working conditions become satisfied;
(c) cumulatively adding up those parts of the delay time during which the engine operating conditions are met;
(d) comparing, upon lapse of the delay time, the sum of the times during which the engine operating conditions have



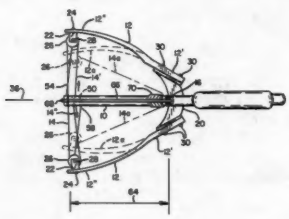
been met, with a predetermined reference time which is less than the delay time; and
(e) detecting possible malfunctions in the exhaust gas recirculation system on the basis of the maximum temperature of the exhaust gas sensed by the temperature sensor, only in cases where the sum of the times during which the engine operating conditons have been met is not less than the reference time.

4,879,987

SHOOTING BOW

Jim Z. Nishioka, 1268 Hemlock NW., Salem, Oreg. 97304

Continuation-in-part of Ser. No. 52,274, May 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 918,074, Oct. 14, 1986, abandoned. This application May 5, 1988, Ser. No. 193,153
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—25 **8 Claims**



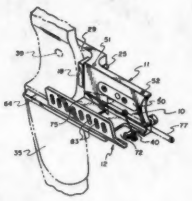
1. A shooting bow comprising
an elongated frame portion,
a bowstring,
bowstring tension means on said frame operatively connected to said bowstring for providing tension in said bowstring,
a pair of rotatable bowstring guide members on said tension means,
said bowstring including a main span extending between said guide members and a pair of end spans extending from said guide members,
a bowstring catch and trigger mechanism on said frame portion for holding said bowstring in a drawn position and for releasing it to propel an arrow or projectile,
said tension means comprising a pair of arms,
each of said arms including a rigid butt portion and a flexible portion, respectively,
said bow also including means connected to said bowstring for providing a let-off of draw force required during end drawing movements of the bowstring, said means controlling bowstring travel and tension, said means being positioned on said frame portion of said bow,
said means for providing a let-off for the bowstring including a cam pivotably supported on said elongated frame portion,
said frame portion including a lateral center, said cam being positioned in said lateral center of said frame portion.

4,879,988

OVERDRAW SYSTEM FOR ARCHERY BOWS

Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah

Filed Nov. 14, 1988, Ser. No. 270,054
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—41 A **19 Claims**



1. An overdraw system for archery bows having a handle riser with accessory inserts, comprising:
a mounting support structure with a longitudinal axis, said structure including:
a mounting element adapted to couple with said handle riser of an archery bow and a support extension;
an overdraw frame carried by said support extension including a bottom element with an open portion constituting an accessory window and a side guard element approximately parallel said mounting support so that said overdraw frame and mounting support cooperatively define a retaining channel; and
a locking system associated with said mounting element including a mounting bolt in mounting relationship with an accessory insert carried by said handle riser, thereby to hold said mounting element against said handle riser with said longitudinal axis approximately transverse said handle riser, first means for holding said mounting element in a selected position along said longitudinal axis and second means for urging said mounting element in a direction away from said selected position.

19. An overdraw system comprising:
an arrow enclosure having:
a base with a bottom and a top;
a cantilevered spring-biased toggle arm cantilevered from the top of said base and pivotally mounted thereto on an axis;
a curved, depending gate element carried by the distal end of said toggle arm; and
biasing means for holding said toggle arm in a normal

central orientation, but adapted to permit pivoting of said arm in either direction about said axis from said normal central orientation;

said base being positioned upon mounting support structure adapted to couple with the handle riser of an archery bow.

4,879,989

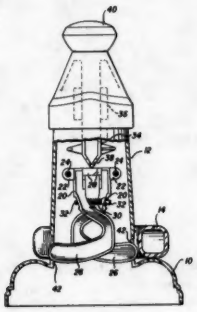
TOY STACKING AND KICKING MECHANISM

David C. Roy, and Marjorie E. C. Roy, both of Stafford Springs, Conn., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Sep. 29, 1987, Ser. No. 102,110

Int. Cl.[4] A63H *13/00*

U.S. Cl. 124—79 **9 Claims**



1. A mechanism for stacking and kicking generally U-shaped objects having a center opening and a passage extending from the center opening through the object at one end thereof, comprising:

a support base;

a post extending upwardly from the support base through the center opening in each of a plurality of objects for guiding and stacking said plurality of objects one above the other on the support base; and

kicking means on the post for kicking one of said objects at a time from the support base.

4,879,990

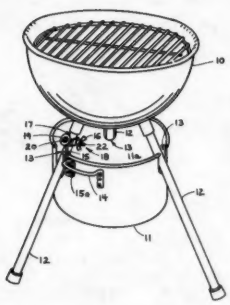
DISCHARGE COLLECTION SYSTEM

Andrew J. Clark, 1226 Sixty-second St., Downers Grove, Ill. 60516

Filed Jul. 13, 1988, Ser. No. 218,573

Int. Cl.[4] F24B *3/00*; F23J *1/00*

U.S. Cl. 126—25 R **1 Claim**



1. A discharge collection system for collecting discharge from an emitting device such as a charcoal fired barbacue grill, said grill including a discharge opening and plurality of supporting legs, said collection system comprising a high sided discharge collector which includes a bottom, an open top, side walls and a plurality of handles protruding from the side walls of the collector; said side walls include a plurality of slots therein into which the plurality of legs extend, portions of the side walls between adjacent slots extending to close proximity to said discharge opening; wherein the collector assembly is supported on at least two of said plurality of legs by a hanger assembly which is rotatable into and out of engagement with the handles; wherein the collector is supported by the hanger assembly when in the engagement position and the collector can be removed when the hanger is moved to the out of engagement position.

4,879,991

ENDOSCOPE

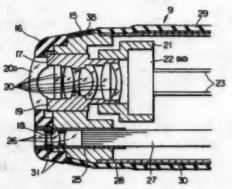
Hisao Ogiu, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 119,459

Claims priority, application Japan, Nov. 12, 1986, 61-270365

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—6 **16 Claims**



1. An endoscope comprising:

an elongated insertable part having a tip at an insertable front end thereof;

a hard tip member having apertures for containing and fitting elements at said tip;

an illuminating means having an illuminating optical system fitted in a first aperture of said hard tip member;

an observing means having an image forming optical system fitted in a second aperture of said hard tip member; and

a cover made of a soft elastic flexible material, said cover being disposed around and covering a peripheral edge part of an insertable front end surface of said hard tip member and the front end surface of said hard tip member for protecting said hard tip member from shock while retaining the overall diameter of said insertable front end, said cover having a plurality of apertures aligned with said apertures of said hard tip member.

4,879,992

RIGID ELECTRONIC ENDOSCOPE

Shinichi Nishigaki, Tokyo; Takeaki Nakamura; Jun Yoshinaga, both of Hino; Masahide Kanno, Hachioji; Hisao Yabe, Hachioji; Takeshi Yokoi, Hachioji; Kazuhiko Oozeki, Hachioji; Yoshikazu Tojo, Hachioji, and Hiromasa Suzuki, Akishima, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 187,199

Claims priority, application Japan, Apr. 27, 1987, 62-104032

Int. Cl.[4] A61B *1/04*

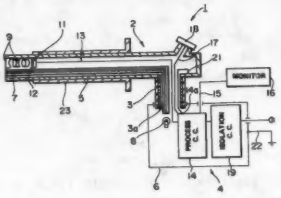
U.S. Cl. 128—6 **4 Claims**

1. A rigid electronic endoscope, comprising:

an endoscope having an elongated insertable portion which is connected to a front portion of an operating part, a holding part on an end portion of said endoscope, a solid state imaging means for outputting an electrical signal by

electrically converting an object image within said insertable portion, and a sheath means of said insertable portion for forming a conductive shielding means;

a signal processing means connected to said imaging means, for processing said electrical signal obtained by said endoscope, said signal processing means having a first ground terminal means; and



an external current source means connected to said signal processing means, said external current source means having a second ground terminal means, said shielding means being connected to said second ground terminal means, wherein said first ground terminal means and said second ground terminal means are isolated from each other for preventing high frequency waves on said sheath means from effecting said electrical signal output of said endoscope.

4,879,993

SHOCK WAVE SOURCE FOR GENERATING A SHORT INITIAL PRESSURE PULSE

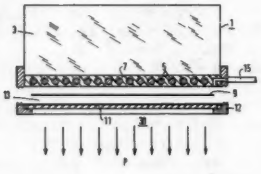
Helmut Reichenberger, Eckental, and Rudolf Schittenhelm, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 6, 1987, Ser. No. 105,004

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636834

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A **20 Claims**



16. A shock wave source comprising:

a high voltage pulse supply;

means adapted for connection to said high voltage power supply for generating an electromagnetic field in response to a pulse from said supply;

flexible electrically conductive means disposed adjacent said means for generating an electromagnetic field for rapidly moving away from said means for generating an electromagnetic field in response to the electromagnetic field generated thereby, said electrically conductive means having a perimeter;

flexible electrically non-conductive means disposed adjacent said electrically conductive means for mechanically interacting with said electrically conductive means as said electrically conductive means moves in response to said electromagnetic field; and

means for holding said electrically non-conductive means at a periphery thereof against said means for generating an electromagnetic field with said electrically conductive means therebetween with the perimeter of said electrically conductive means substantially mechanically unrestrained.

4,879,994

DEVICE FOR MEDICALLY TREATING HIP JOINT INSUFFICIENCY, ETC.

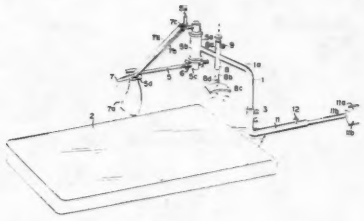
Hazime Watanabe, 11168-4, Sugita, Fujinomiya, Shizuoka, Japan

Filed Jan. 21, 1988, Ser. No. 146,681

Claims priority, application Japan, Apr. 16, 1987, 62-57860

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—70 **9 Claims**



1. A device for medically treating a condition such as a hip joint problem, comprising:

a supporting post extending in a vertical direction;

a shaft extending in a vertical direction and rotatably supported at a free end of said supporting post, said shaft including a retaining device at an upper end thereof;

a swinging arm extending in a horizontal direction and supported at a lower end of said shaft, said swinging arm having a free end spaced from said shaft, said free end of said swinging arm being movable towards and away from said shaft for positioning thereof and said free end of said swinging arm comprising a bifurcated member;

a hanger for holding a body part such as a leg, said hanger comprising a hanging belt having hanger straps extending from opposite ends thereof and hanging devices at free ends of said hanger straps, said hanging devices being attached to said retaining device and said hanger straps being supported by said bifurcated member at respective portions of said hanger straps adjacent to said hanging belt; and

a presser for pressing against a body part such as a hip, said presser including a member supported on said supporting post, said member extending in a vertical direction and having a free end thereof spaced from said supporting post, said free end of said member being movable toward and away from said supporting post for positioning thereof, said presser further including a pad mounted on said free end of said member.

4,879,995

SNORKEL FOR SKIN DIVERS

Tony Christianson, 277 Grulla Ct., Norco, Calif. 91760

Filed Oct. 13, 1987, Ser. No. 107,987

Int. Cl.[4] B63C *11/16*

U.S. Cl. 128—201.11 **20 Claims**

1. A snorkel device comprising:

a first conduit adapted to extend above the water surface when said snorkel device is in use and supported by a diver swimming face down on the water surface, said first conduit having first and second ends thereof;

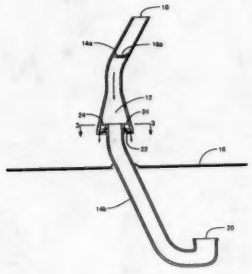
said first end of said first conduit being open whereby it is unobstructed and freely admits ambient fluid into said snorkel device;

a length of said first conduit adjacent said second end of said

first conduit expands thereby forming a first chamber which has flared sides, said first chamber having bottom and ambient openings thereof;

said length of said first conduit expands such that the forces of cohesion and adhesion cause water to flow down the inner surface of said first conduit and said first chamber to said ambient opening;

a second conduit adapted to extend below the water surface, and having first and second ends thereof;



said first end of said second conduit joined to communicate fluid flow with said first chamber via said first chamber bottom opening;

mouthpiece means adjacent said second end of said second conduit and joined to communicate fluid flow with the interior of said second conduit; and

purge valve means disposed in said first chamber ambient opening and arranged to provide unidirectional fluid flow to ambient from the interior of said first chamber.

4,879,996

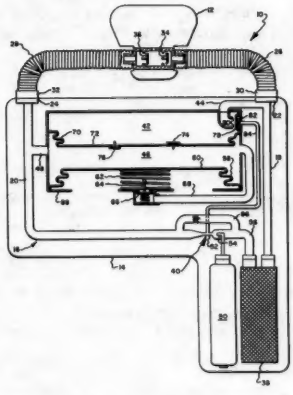
CLOSED CIRCUIT BREATHING APPARATUS

Van N. Harwood, Jr., 26 The Spur, Williamsville, N.Y. 14221; Jeffrey J. Dosch, 147 University Ave., Buffalo, N.Y. 14214, and Loyal G. Netteland, 108-1 Wimbledon Ct., West Seneca, N.Y. 14224

Filed Jan. 13, 1987, Ser. No. 2,877

Int. Cl.[4] A62B *7/08*

U.S. Cl. 128—202.26 **20 Claims**



1. A single person portable closed circuit breathing apparatus (10) having low breathing resistance at all work rates; said apparatus comprising:

gas circulating circuit means (16) including a mask (12), exhalation passageway means (18), a carbon dioxide absorber (38), and inhalation passageway means (20) which are connected to each other in sequence to provide for gas flow from the mask to the exhalation passageway means, through the carbon dioxide absorber, to the inhalation passageway means, and then back to the mask, pump means (40) in circuit with the carbon dioxide absorber and capable when driven of forcing exhaled gases through the carbon dioxide absorber at a relatively constant volumetric rate, an exhalation gas accumulator means (42, 142) in fluid communication with the exhalation passageway means, and a collapsible inhalation gas accumulator means (46) in fluid communication with the inhalation passageway means and also in fluid communication with the exhalation gas accumulator means so that, the interconnected accumulator means maintain system gases at the same pressure to either side of the carbon dioxide absorber and permit transfer of gases from either the exhalation gas accumulator means or the inhalation gas accumulator means to the other gas accumulator means without excessive mixing of inhalation and exhalation gases, and spring means associated with said inhalation gas accumulator means to place the gas within the gas circulating circuit means at a pressure above ambient; and

a source of makeup oxygen (50) connected to the gas-circulating circuit means.

4,879,997

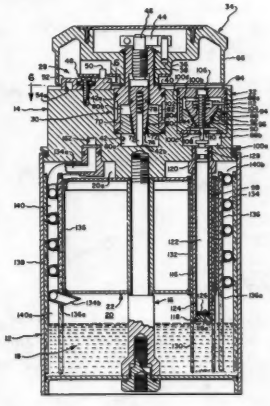
ANESTHETIC VAPORIZER

Allan M. Bickford, 1581 Hubbard Rd., East Aurora, N.Y. 14052

Filed Apr. 7, 1988, Ser. No. 178,528

Int. Cl.[4] A61M *11/00*

U.S. Cl. 128—200.21 **7 Claims**



6. An anesthetic vaporizer including in combination:

a container for receiving liquid volatilizable anesthetic, said container having a cylindrical side wall and top and bottom walls and is fitted with a space occupying device cooperating with said container to define a lower chamber for receiving said liquid volatilizable anesthetic, an upper chamber and an annular passage adjacent said cylindrical side wall extending between said lower and upper chambers;

an inlet for receiving a gas and an outlet for discharging a mixture of the gas and volatilized anesthetic;

first conduit means for conducting said gas from said inlet to said container so as to entrain vaporized anesthetic therein

and create a preliminary mixture of said gas and volatilized anesthetic and conducting said preliminary mixture towards said outlet, and including a spirally wound tube having a fluid impermeable wall with one end thereof disposed in flow communication with said inlet and a second end thereof disposed in flow communication with said lower chamber above the level of said liquid volatilizable anesthetic, a spiral passage bounded by the coils of said tube and a pair of cylindrical wick members extending one between said tube and said cylindrical side wall and the other between said tube and said space occupying device, said pair of wick devices having lower ends thereof extending into said lower chamber for immersion within said liquid volatilizable anesthetic, said spiral passage having one end disposed in flow communication with said lower chamber above the level of said liquid volatilizable anesthetic and a second end disposed in flow communication with said upper chamber, and an adjustable flow control valve for regulating the flow of said preliminary mixture from said upper chamber to said outlet;

second conduit means for conducting said gas from said inlet for mixing with said preliminary mixture at a point intermediate said flow control valve and said outlet to create said mixture, and including an adjustable bypass control valve for regulating the flow of said gas prior to mixing thereof with said preliminary mixture; and

one of said valves is adjustable in response to the temperature existing within said lower chamber.

4,879,998

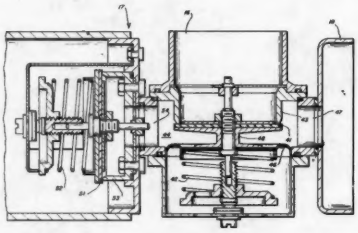
BALANCED EXHALATION VALVE FOR USE IN A CLOSED LOOP BREATHING SYSTEM

Chris M. Moellers, Davenport, Iowa, assignor to Litton Systems, Inc., Davenport, Iowa

Division of Ser. No. 90,554, Aug. 28, 1987, Pat. No. 4,774,942. This application May 6, 1988, Ser. No. 191,181

Int. Cl.[4] A62B *9/02*

U.S. Cl. 128—205.24 **3 Claims**



1. A balanced exhalation valve which opens and closes in response to the exhalation cycle of a user comprising:

a flow path through the valve comprising an inlet port, a chamber, and an outlet port;

a main valve which opens into the chamber between the inlet port and the chamber;

means biasing the main valve to a normally closed position, whereby positive exhalation pressure applied to the main valve from the inlet port causes the main valve to open into the chamber, and zero pressure or negative pressure causes the main valve to close; and

flexible diaphragm balancing means coupled to the main valve for preventing a pressure increase in the chamber when the main valve is closed from increasing the force necessary to open the main valve, wherein the flexible diaphragm comprises one wall of the chamber, and pressure on the flexible diaphragm aids in opening the main valve.

4,879,999

DEVICE FOR THE DETERMINATION OF PROPER ENDOTRACHEAL TUBE PLACEMENT

Basil C. Leiman; Bruce D. Butler; Jeffrey Katz, and Henry H. Salzarulo, all of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 844,090, Mar. 26, 1986, abandoned. This application Jun. 5, 1987, Ser. No. 58,830

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.14 **26 Claims**

1. An endotracheal device comprising:

(a) a tubular housing having one end adapted for insertion into a patient's trachea and an other end adapted for placement external of the patient, the housing defining lumen means therethrough from one end to the other end for allowing bidirectional passage of air into and out of the patient to ventilate the patient's lungs; and

(b) colorimetric carbon dioxide indicator means mounted within the lumen means for determining the presence of carbon dioxide therein while still permitting unimpeded bidirectional flow of air therethrough to ventilate the patient's lungs.

4,880,000

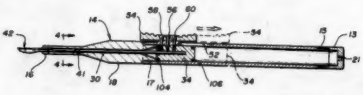
LENS INSERTION INSTRUMENT

Martin J. Holmes, Los Angeles, and Ron Harris, Claremont, both of Calif., assignors to Iolab Corporation, Claremont, Calif.

Filed Dec. 15, 1987, Ser. No. 132,290

Int. Cl.[4] A61F *2/16*

U.S. Cl. 128—303 R **12 Claims**



1. A lens holder for a surgical instrument used or inserting an intraocular lens into the eye comprising:

an elongated stylet having a proximal end and a distal end and having an exterior surface;

a flexible paddle;

means for affixing said paddle to the distal end of said stylet so that said paddle extends distally from the distal end of said stylet including a slot extending transversely into said

exterior surface of said stylet for receiving a portion of said paddle; and

wherein the distal portion of said paddle includes a lens holding portion and the proximal portion of said paddle includes a mounting portion said mounting portion including margins to wrap around a distal portion of said stylet and fit into said slot.

4,880,001

PROCESS FOR CONTROLLING THE PHOTOCOAGULATION OF BIOLOGICAL TISSUE

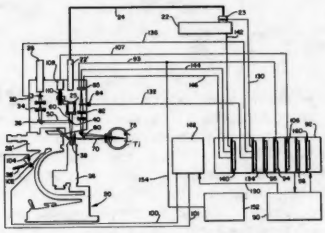
Wolfram S. Weinberg, Austin, Tex., assignor to Promed Technology, Inc., Dallas, Tex.

Division of Ser. No. 57,692, May 26, 1987, Pat. No. 4,719,912. This application Jan. 19, 1988, Ser. No. 145,140

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, 3306981

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **15 Claims**



1. A process for controlling the photocoagulation of biological tissue in which light is imaged on a zone which includes the area to be coagulated by a treatment light source and the region around it, comprising the steps of: measuring luminance in partial areas of the zone covering the area irradiated by the treatment light source and the region around it; determining values of luminance of the partial areas; comparing the determined values of the luminance of the partial areas and the quantities derived therefrom with predetermined values; and controlling irradiation by the treatment light source in response to a change in the luminance of a partial area of the zone relative to the luminance of the same or another partial area of the zone or of a partial area of the region around the zone.

4,880,002

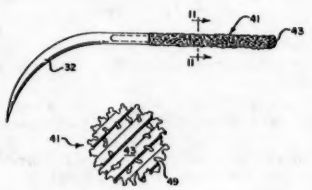
STRETCHABLE POROUS SUTURES

David C. MacGregor, Miami, Fla., assignor to Corvita Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 839,545, May 30, 1985, Pat. No. 4,712,553, and a continuation-in-part of Ser. No. 54,750, May 27, 1987. This application Dec. 9, 1987, Ser. No. 130,746

Int. Cl.[4] A61L *17/00*; A61B *17/06*; C08J *9/26*

U.S. Cl. 335.5 **14 Claims**



7. A non-braided surgical suture, comprising:

a suture material including: an elongated flexible, non-metallic generally cylindrical and elastomeric polymeric member having an initial, unstretched length and a plurality of pores, said elongated flexible and elastomeric member being a polyurethane or a polycarbonate having a plurality of pores has an external diameter that is no larger than that of a surgical suture, has a porous surface that promotes tissue ingrowth into said porous elongated flexible member, and is axially stretchable to a substantial extent beyond its said initial unstretched length, whereby said suture is compliant with host tissue when it is implanted; and

a needle member attached to a radially compressed end portion of said elastomeric and porous suture material.

4,880,003

CABIN FOR CARRYING OUT CRYOTHERAPY

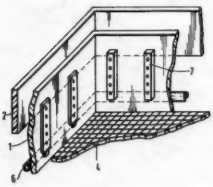
Andreas Donnerhack, Krefeld; Klemens Thoma, Krefeld-Huls; Wolfgang Volker, Tonisvorst; Thomas Stratz, and Rolf-Dieter Gallmeister, both of Bad Säckingen, all of Fed. Rep. of Germany, assignors to Messer. Griesheim, Fed. Rep. of Germany

Continuation of Ser. No. 907,321, Sep. 11, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 205,510

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534630

Int. Cl.[4] A61H *33/06*

U.S. Cl. 128—374 **12 Claims**



1. In a cabin for carrying out cryotherapy on an entire body of a patient with a cold treatment gas, the cabin having walls of insulating material, a door for entering the cabin, emanating devices for the treatment gas mounted on the walls, a return arrangement for the treatment gas, the improvement being in that said cabin is formed by a floor and by upstanding side walls having an upper edge spaced by a distance from the floor and by no top wall whereby said cabin is open from above to permit the head of the patient to extend above said cabin, said door being upstanding to create a closable vertical entrance into said cabin, and said distance from said upper edge of said walls to said floor of said cabin being adjustable to be level to the patient's neck.

4,880,004

IMPLANTABLE CARDIAC STIMULATOR WITH AUTOMATIC GAIN CONTROL AND BANDPASS FILTERING IN FEEDBACK LOOP

Ross G. Baker, Jr.; Richard V. Calfee, both of Houston; Edward A. Haluska, Angleton, and Stephen J. Whistler, Lake Jackson, all of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Jun. 7, 1988, Ser. No. 203,322

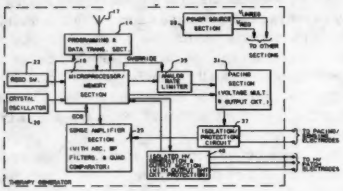
Int. Cl.[4] A61N *1/00*; H05G *00/00*

U.S. Cl. 128—419 PG **34 Claims**

1. Apparatus for detecting cardiac arrhythmias by analyzing ECG signals produced by the heart, comprising:

filter means forming dual signal paths having different bandpass characteristics for receiving said ECG signals, one of said signal paths constituting means for determining a

sensing level for the ECG signals, and the other of the signal paths constituting feedback loop means for determining ECG signal gain and a sensing margin which is a function of the frequency content of the ECG signal.



4,880,005

PACEMAKER FOR DETECTING AND TERMINATING A TACHYCARDIA

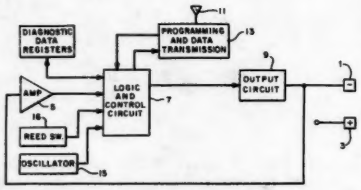
Benjamin D. Pless, Palo Alto, and Michael B. Sweeney, Mountain View, both of Calif., assignors to Intermedics, Inc., Angleton, Tex.

Continuation of Ser. No. 765,047, Aug. 12, 1985, abandoned. This application May 23, 1988, Ser. No. 198,614

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **38 Claims**

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 47 Pages)



1. An antitachycardia pacemaker, comprising:

means for detecting electrical cardiac events occurring in at least one chamber of the heart;

means for detecting said events which exceed a selected tachycardia rate;

means for determining the relative rate stability of the events which exceed said tachycardia rate;

means responsive to said event detecting means and said stability determining means for detecting a pace-terminable tachycardia when at least a first selected number of said events exceed said tachycardia rate and a second selected number of said events have a defined rate stability; and

means responsive to said pace terminable tachycardia detecting means for pacing the heart to terminate the tachycardia.

4,880,006

BONE INGROWTH CHAMBER

Tomas Albrektsson, Mölndal, and Per Aspenberg, Lund, both of Sweden, assignors to Nobelpharma AB, Gothenburg, Sweden

Filed Nov. 23, 1987, Ser. No. 124,149

Claims priority, application Sweden, Nov. 21, 1986, 8604973

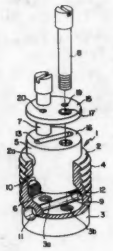
Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—630 **12 Claims**

1. An apparatus of a bio-compatible material for implantation in a living bone tissue and for studying bone tissue formation growth in an implant in response to a locally administered test substance, said apparatus comprising;

an outer portion with a central recess extending therethrough and a removable inner portion insertable in said central recess;

means provided in at least a bottom wall of said outer portion cooperating with a bottom wall of said inner portion to form a bone tissue ingrowth channel when said inner portion is fully inserted into said central recess, said channel being exposable for access thereto when said inner portion is removed upwardly, thereby allowing examination of said bone tissue ingrowth in said channel; and



a reservoir provided in said inner portion, said reservoir including means for fluid communication with said bone tissue ingrowth channel for supplying said test substance to said bone tissue ingrowth channel.

4,880,007

CONTRAST AGENT FOR NMR SCANNING

Peter J. Sadler, Harrow Weald; Charles T. Harding, Bovington; James D. Kelly, Amersham, and Andrew B. McEwen, Streatham, all of England, assignors to Amersham International PLC, Little Chalfont, United Kingdom

Filed Jul. 11, 1986, Ser. No. 884,622

Claims priority, application United Kingdom, Jul. 19, 1985, 8518300

Int. Cl.[4] A61K *49/00*

U.S. Cl. 128—653 **21 Claims**

1. A method of investigating calcified tissue, which method comprises administering to a human patient a complex formed between (a) an amino di- or poly-phosphonate in which phosphonate groups comprise different carbon atoms, and (b) a paramagnetic metal ion, and thereafter subjecting the patient to NMR scanning.

4,880,008

VIVO ENHANCEMENT OF NMR RELAXIVITY

Randall B. Lauffer, Boston, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 731,841, May 8, 1985. This application May 7, 1986, Ser. No. 860,540

Int. Cl.[4] A61K *49/00*

U.S. Cl. 128—654 **11 Claims**

1. A method of decreasing the NMR relaxation times (T_1 or T_2) of water protons in contact with a biological tissue, said method comprising:

providing an NMR contrast agent which does not include an antibody and which comprises a paramagnetic ion selected from the group of ions consisting of gadolinium (III), iron (III), manganese (II and III), chromium (III), copper (II), dysprosium (III), terbium (III); holmium (III), erbrium (III) and europium (III), complexed with a chelating substance having at least one aryl ring which may be substituted in one or more positions with members of the group consisting of the halogens and the C_1–C_{10} alkyl

groups, said contrast agent being characterized in that it is capable of binding non-covalently to ligandin, or Protein A, or HSA of said tissue and as a result of such binding is capable of enhancing relaxivity of said water protons by a factor of at least 2, compared to the relaxivity induced by said paramagnetic substance alone free in solution,

administering said NMR contrast agent to a human patient, and

subjecting said patient to NMR imaging.

4,880,009

ULTRASONIC IMAGING APPARATUS

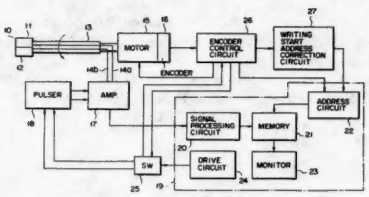
Yutaka Yanagawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1987, Ser. No. 85,544

Claims priority, application Japan, Aug. 15, 1986, 61-191441

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—660.09 **10 Claims**



1. An ultrasonic imaging apparatus comprising: ultrasonic transducer means which is rotatably arranged and includes a plurality of ultrasonic transducer elements arranged in a circumferential direction, to perform a radial scan;

transducer rotating means for rotating said transducer means;

switching means for selectively switching said transducer elements, to select one of said transducer elements in accordance with a focal length of an ultrasonic wave, at any randomly selected position of said ultrasonic transducer means;

transducer driving means for driving the selected one of said ultrasonic transducer elements, to instantaneously scan different sectors after the switching of said transducer elements and to emit an ultrasonic beam therefrom and output echo signals corresponding to echoes;

processing means for signal-processing said echo signals and converting said echo signals into an image signal;

address means for outputting writing start address data corresponding to the selected one of said transducer elements; and

memory means for storing said image signal at an address corresponding to the writing start address data output from said address means whereby said image signal will be stored in a correct address in said memory means when said transducer means is randomly switched to change a focal length of said transducer.

4,880,010

METHOD OF AND APPARATUS FOR ULTRASONIC IMAGING

John Szilard, 12 Belvoir Drive, Loughborough, LE11 2SW, United Kingdom

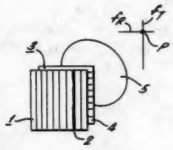
PCT No. PCT/GB87/00485, § 371 Date May 12, 1988, § 102(e) Date May 12, 1988, PCT Pub. No. WO88/00710, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 9, 1987, Ser. No. 170,387

Claims priority, application United Kingdom, Jul. 18, 1986, 8617567

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—661.01 **17 Claims**



1. A method of acoustic imaging comprising the steps of:

transmitting a line focused acoustic wave pulse signal obtained from a plurality of transmitting elements by phase delay techniques into a body; detecting return signals from any target encountered in the body by the transmitted wave pulse signal using a line focused receiver comprising a plurality of receiving elements focused using phase delay techniques and having a focal line crossing the focal line of the transmitter at a crossing point;

electronically controlling the transmitter and receiver to cause said crossing point to scan a surface within the body; and

producing an image from the return signals received by the receiver.

4,880,011

ULTRASONIC ENDOSCOPE APPARATUS

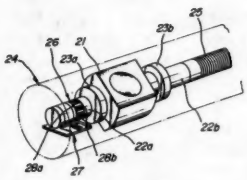
Shinichi Imade; Kazunori Shionoya; Eishi Ikuta; Koji Taguchi; Toyoo Nishiyama; Seiichi Wakamatsu, all of Hachioji, and Tatsuo Nagasaki, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,171

Claims priority, application Japan, Apr. 30, 1987, 62-106746

Int. Cl.[4] A61B *8/12*

U.S. Cl. 128—662.06 **15 Claims**



1. An ultrasonic endoscope apparatus having an elongated insertion section, a distal end of which is inserted in an object to be inspected, said ultrasonic endoscope apparatus comprising:

an ultrasonic vibrating element rotatably housed in said distal end, said ultrasonic vibrating element radiating an ultrasonic wave to obtain an image of said object;

means for rotating said ultrasonic vibrating element about a rotation axis;

a magnetic recording section provided in said distal end, said

magnetic recording section having a given pattern of magnetization for forming a magnetic field; and

a magnetic sensor having at least one magneto-resistive element for sensing said magnetic field;

means for mounting at least one of said recording section and magnetic sensor so that it rotates integrally with said ultrasonic vibrating element to cause said magnetic sensor to sense a change of said magnetic field representing a rotation angle of said ultrasonic vibrating element.

4,880,012

ULTRASONIC PROBE

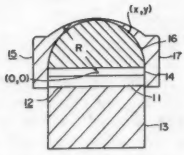
Shobei Sato, Osaka, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 15, 1988, Ser. No. 144,004

Claims priority, application Japan, Jan. 19, 1987, 62-8208

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—663.01 **1 Claim**



1. An ultrasonic probe comprising:

at least one vibrator that generates and receives ultrasonic waves; and

a composite lens disposed on the emission face of said at least one vibrator, said composite lens having a first acoustic lens layer adjacent said at least one vibrator and a second acoustic lens layer adjacent said first lens layer, said first acoustic layer having an attenuation constant at a given frequency different from the attenuation constant of said second acoustic layer at said given frequency, said second acoustic lens layer having an outer emission surface with respect to said at least one vibrator, said first acoustic lens layer and said second acoustic lens layer being configured so that the amount of attenuation of the ultrasonic wave passing through said composite lens at a point on said outer emission surface is substantially equal to that passing through said composite lens at any other point on said outer emission surface, while the focussing ability of said lens is preserved.

4,880,013

METHOD AND APPARATUS FOR DETERMINING BLOOD PRESSURE AND CARDIOVASCULAR CONDITION

Shiu-Shin Chio, 1012 Timberland Dr., Indianapolis, Ind. 46260

Filed Mar. 24, 1988, Ser. No. 172,660

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—681 **44 Claims**

1. A method of determining blood pressure of a patient comprising the steps of:

a. affixing a non-invasive pressure inducing means and transducer means to the patient,

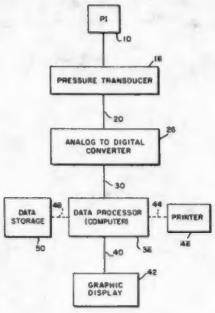
b. elevating the pressure induced by the pressure inducing means to a suprasystolic pressure,

c. decreasing the pressure induced by the pressure inducing means over time to a pressure below diastolic pressure,

d. obtaining a data stream from the transducer means, the data stream including pressure data and pulsation signal data,

e. processing said data stream to create an information stream which correlates the pressure data and the pulsation signal data, the information stream including at least two pulse maximum points and at least two pulse minimum points, and

f. examining the information stream to determine at least one of the systolic, diastolic and mean arterial pressures of the



patient by selecting at least one of the at least two pulse minimum points as a point for determining said at least one of the systolic, diastolic and mean arterial pressure of the patient.

4,880,014

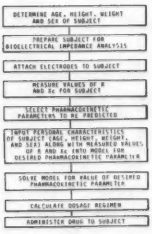
METHOD FOR DETERMINING THERAPEUTIC DRUG DOSAGE USING BIOELECTRICAL RESISTANCE AND REACTANCE MEASUREMENTS

Barbara J. Zarowitz, 6045 Shillingham Dr., West Bloomfield, Mich. 48033, and Diana L. Twyman, 1978 Villa, Birmingham, Mich. 48008

Continuation-in-part of Ser. No. 85,850, Aug. 14, 1987, abandoned. This application Feb. 26, 1988, Ser. No. 160,589

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—734 **11 Claims**


DETERMINE AGE, HEIGHT, WEIGHT AND SEX OF SUBJECT
PREPARE SUBJECT FOR BIOELECTRICAL IMPEDANCE ANALYSIS
ATTACH ELECTRODES TO SUBJECT
MEASURE VALUES OF R AND Xc FOR SUBJECT
SELECT PHARMACOKINETIC PARAMETERS TO BE PREDICTED
INPUT PERSONAL CHARACTERISTICS OF SUBJECT (AGE, HEIGHT, WEIGHT, AND SEX) ALONG WITH MEASURED VALUES OF R AND Xc INTO MODEL FOR DESIRED PHARMACOKINETIC PARAMETER
SOLVE MODEL FOR VALUE OF DESIRED PHARMACOKINETIC PARAMETER
CALCULATE DOSAGE REGIMEN
ADMINISTER DRUG TO SUBJECT

1. A method for determining a therapeutic drug dosage regimen for a biological subject which comprises the steps of:

providing a first equation which relates at least one of the following personal characteristics, resistance, reactance, age, height, weight and sex of the subject, to a predictive value for volume of distribution (V) for a preselected drug in said subject;

providing a second equation which relates at least one of the following personal characteristics, resistance, reactance, age, height, weight and sex of said subject, to a predictive value for elimination rate constant (K) for said preselected drug in said subject;

determining the value of said personal characteristics of said subject which are related to said first equation for the predictive value for V;

determining the value of said personal characteristics of said subject which are related to said second equation for the predictive value for K;

calculating said predictive value of V using said first equation and said value of said measured personal characteristics related to said first equation;

calculating said predictive value of K using said second equation and said value of said measured personal characteristics related to said second equation;

determining a desired therapeutic concentration of said preselected drug for said subject; and

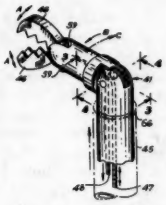
calculating a dose and dosing interval to obtain said therapeutic concentrations of said drug using said calculated predictive values of V and K.

4,880,015

BIOPSY FORCEPS

David M. Nierman, 250 E. 87th St., Apt. 30-G, New York, N.Y. 10128

Filed Jun. 3, 1988, Ser. No. 202,169
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—751 **24 Claims**



1. A biopsy forcep comprising:

a. a flexible catheter having a distal and proximal end, said distal end being designed so as to be placed within a patient's body to obtain a biopsy sample and said proximal end being designed so as to be located outside of said patient's body and including means for controlling components of said biopsy catheter located at about the distal end of said flexible catheter;

b. a forcep cup assembly attached to the distal end of said flexible catheter;

c. a first hinge means attached to said flexible catheter placed proximally in relation to said forcep cup assembly, said first hinge means controlling the opening and closing of said forcep cup assembly and;

d. a second hinge means attached to said flexible catheter placed proximally in relation to said first hinge means and said forcep cup assembly, said second hinge means controlling the articulation of the portion of said biopsy forcep including said forcep cup assembly and first hinge means, said second hinge means and resultant articulation being controllable from the proximal end of said flexible catheter.

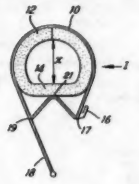
4,880,016

PENILE CLAMP

Peter H. L. Worth; Ann Eaton, both of London, and Peter L. Steer, Surrey, all of England, assignors to E. R. Squibb and Sons, Inc., Princeton, N.J.

Filed May 13, 1988, Ser. No. 193,695
Claims priority, application United Kingdom, May 22, 1987, 8712189
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—885 **3 Claims**

1. A penile clamp comprising an outer flexible member that encircles an inner cushioning member, said cushioning member dimensioned to fit around a penile shaft, said cushioning member being circular for most of its periphery but with a substantially straight portion which in use contacts the underside of the penile shaft, the portion of said outer flexible member adjacent said straight portion of said cushioning member having a configuration shaped like the letter W, the middle apex of said W contacting a central portion of said straight portion of said cushioning member and the outer apices of said W having



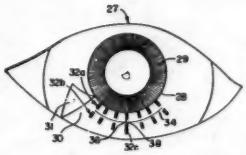
adjustable fastening means wherein a tightening of said outer flexible member draws said outer apices closer together causing a localized pressure to be applied to a central portion of the underside of the penile shaft by the middle apex of said W.

4,880,017

METHOD OF MAKING THE SCLERA AND/OR LIMBUS IN INTRAOCULAR SURGERY

David B. Soll, 5001 Frankford Ave., Philadelphia, Pa. 19124, and Stephen J. Failla, 39 Dogwood Dr., Chester, N.J. 07930

Filed Apr. 5, 1988, Ser. No. 177,716
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—898 **14 Claims**



1. A method for marking the sclera and/or limbal portion of an eye prior to intraocular surgery to help control and prevent postoperative astigmatism using a marking device, wherein the marking device comprises a generally arcuate body member having opposed first and second major surfaces, and a plurality of projections extending from the first major surface, the projections being generally equiangularly spaced from each other and radially arranged in a pattern along the arc of a circle, the method comprising reflecting the conjunctiva of the eye so as to expose the sclera and/or limbus of the eye, coating waterproof ink onto the projections of the device, pressing the device onto the sclera and/or limus with sufficient pressure to transfer ink from the projections onto the sclera and/or limbus to create ink markings corresponding to the projections, the projections being spaced and aligned with respect to the sclera and/or limbus so that incisions and sutures can be made in the eye relative to the markings to standardize and define incisions and suture placement with respect to the sclera and/or limbus, and removing the device from the eye.

4,880,018

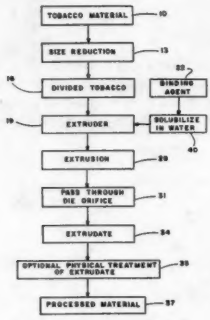
EXTRUDED TOBACCO MATERIALS

William H. Graves, Jr., Pfafftown; Gary W. Wallace, Winston-Salem; Bruce P. Bradford, Lewisville; Carolyn R. Carpenter; Kenneth W. Smith, both of Winston-Salem, and Howard C. Toft, Clemmons, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 826,462, Feb. 5, 1986, Pat. No. 4,724,850. This application Jul. 31, 1987, Ser. No. 80,715

Int. Cl.[4] A24B *3/14*

U.S. Cl. 131—375 55 Claims



1. A process for providing smokable material in extruded form, the process comprising:

(a) contacting filler material, at least a portion of which is tobacco material, with a binding agent which includes a galactomannan and xanthan gum; and

(b) subjecting the filler material and binding agent to extrusion conditions including temperature and moisture such that the binding agent components can be solubilized and the binding agent is activated.

4,880,019

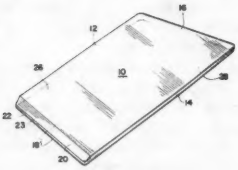
HAIR COLORING IMPLEMENT

Valerie J. Roubo, 154 Whitehorse Ave., Trenton, N.J. 08610

Filed Mar. 21, 1988, Ser. No. 170,802

Int. Cl.[4] A45D *19/18*

U.S. Cl. 132—270 6 Claims



1. A hair treating implement comprising a platform with a top and a bottom having a first edge comprising a first plane surface which is beveled in relation to said top surface wherein said platform further comprises a second edge comprising a second plane surface slanted in relation to said first edge wherein said first plane surface is beveled approximately 20 degrees.

4,880,020

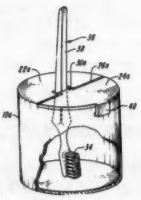
TRAVELING TOOTHBRUSH HOLDER

Jeffrey S. Schurman, 57 Sears Rd., Wayland, Mass. 01778

Filed Mar. 21, 1988, Ser. No. 142,546

Int. Cl.[4] A45D *44/18*

U.S. Cl. 132—308 6 Claims



1. A traveling toothbrush holder comprising:

a cup shaped receptacle having a side wall, a bottom, a top which is at least partially open, and a peripheral rim around the open top;

a lid on the top, having a first portion affixed to the peripheral rim of the receptacle, and a second portion hinged to the first portion and pivotable to a raised open position and to a closed position in engagement with the rim;

the lid having retaining means which includes:

an opening through a central portion of the lid on one portion of the lid, and a tab on the other portion of the lid;

the second portion of the lid in its raised position having one of the opening or tab disposed transversely to the plane of the first portion of the lid to provide access for insertion of a toothbrush through the opening;

the second portion of the lid in its closed position having the other of the opening or tab generally coplanar with the plane of the lid to engage and retain the toothbrush disposed through the lid opening.

4,880,021

DEVICE FOR CLEANING CANS

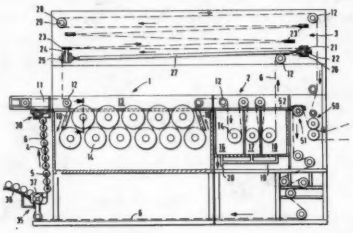
Karl Haberstroh, Hohenkrahenstr. 2,, D-7703 Rielasingen-Worblingen, Fed. Rep. of Germany

Filed Jan. 5, 1988, Ser. No. 148,659

Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615538; Aug. 1, 1986, 3626176

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—62 15 Claims



1. A device for cleaning containers having a base and an open top connected by sidewall means which together with said base defines an internal cavity having a longitudinal axis, the improvement comprising: a wash zone, a rinse zone and a dry zone; a continuous conveyor means for transporting said containers to said wash zone, from said wash zone to said rinse zone and from said rinse zone to said dry zone, said conveyor means includes means for penetrating the internal cavity of the

containers for holding said containers on said conveyor means; and drive means for driving said conveyor such that said containers pass through said wash zone and said rinse zone with said longitudinal axis located in a substantially horizontal plane wherein the cavity, sidewall means and base are cleaned and rinsed and said containers pass through said dry zone with said longitudinal axis located in a substantial vertical plane wherein said open top is directed downwards so as to allow fluid to drip from the internal cavity of the containers wherein the conveyor means loops round a feed roller with a horizontal roller shaft and is then guided approximately horizontally to a toothed gear with a vertical shaft upon entering the dry zone.

4,880,022

APPARATUS FOR TREATING SMALL ITEMS

Lars A. H. Hakansson, Lindöhillsvägen 15, S-603 65 Norrköping, Sweden

Filed Sep. 13, 1988, Ser. No. 243,757
Claims priority, application Sweden, Sep. 14, 1987, 8703548
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—120 5 Claims

1. Apparatus for treating small items and comprising:

a treatment-liquid container (2) and a substantially cylindrical, rotatable drum (3) into which small items to be treated are introduced;

the drum (3) being journalled for rotation at the upper part of the container (2) and being provided at one end with infeed means (5) for feeding the items into said drum and with treatment-liquid supply or outfeed means (22, 23, 24, 25), and at its other end being provided with item-outfeed means (18, 19, 20) and with treatment-liquid outfeed or supply means (25; 22, 23, 24);

the drum (3) being provided on an inner surface of a shell (13) thereof with transporting devices (16) in the form of strip means which extend helically around a rotational axis of the drum (3) and which are effective, as the drum (3) rotates, in moving said items from the infeed means (5) towards the item outfeed means (18, 19, 20);

the shell (13) of the drum (3) being substantially liquid-impervious; both opposite end walls (14, 15) provided on said drum being substantially liquid-impervious with the exception of said item infeed and outfeed means and treatment liquid supply and outfeed means respectively;

the treatment-liquid supply means comprising at least one scoop means (22) which is arranged on the outside of the end wall (15) of the drum (3) and which extends radially from an opening (23, 24) in one said end wall (15) and the radially outer end of which is located on a radius, which allows said end to be immersed in the treatment liquid in the container (2) upon rotation of the drum (3), such as to collect treatment liquid from the container and supply said liquid to the drum interior through said opening (23, 24) in said end wall (15).

4,880,023

UMBRELLA FRAME

Cheing-Young Lin, No. 6, Alley 23, Lane 273, Sec. 3, Tungmen Rd., Tainan Hsien, Taiwan

Filed Oct. 3, 1988, Ser. No. 252,857
Int. Cl.[4] A45B *3/00*
U.S. Cl. 135—25 R 8 Claims

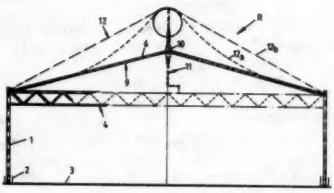
1. An umbrella frame comprising a stick, a plurality of outer dome ribs, a plurality of struts, and a plurality of stretcher members, wherein said stick is provided with a crown at an upper end thereof and is provided with a runner which is slidable therealong; said crown being connected to said stretcher members, said runner being connected to said struts and each, said strut being connected to said runner at one end and to a first pivotal joint on said stretcher member at another end, each said stretcher member being connected to said crown at one end thereof and to one of said first pivotal joints at another end thereof; said umbrella frame characterized in that: said umbrella frame further comprises two looped-shaped ribs on said runner, two braces each having ends, and each being connected at one end to a second pivotal joint on one of said stretcher members and at another end to said looped-shaped ribs so as to support said looped-shaped ribs, and two catchers formed on two corresponding stretcher members between said first pivotal joint and said second pivotal joint for fixing each of the corresponding looped-shaped ribs.

4,880,024

SELF-SUPPORTING TENT

Siegfried Brell, Furstenbergstrasse 88-90, 7750 Konstanz, Fed. Rep. of Germany

Filed Apr. 10, 1987, Ser. No. 36,591
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1986, 3612623
Int. Cl.[4] E04H *15/34*
U.S. Cl. 135—101 10 Claims



1. A self-supporting tent having a roof membrane comprising at least a first, a second and a third substantially vertical side post each defining a corner of the tent and to which the roof membrane is secured; a truss member extending between the upper end of each side post, at least one truss member comprises an upper and a lower supporting rod interconnected by means of struts and the other truss members comprise an

upper supporting rod supported by steadying struts against the side posts; lifting means connected to said roof membrane for selectively moving said roof membrane between an untensioned position and a tensioned position; a structural member extending between the upper end of each side post and the lifting means and defining therewith a first junction point; and at least one rod extending in a substantially vertical direction from said one truss member to said first junction point.

4,880,025

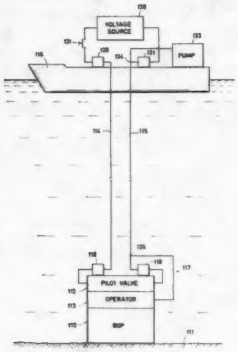
BOP CONTROL SYSTEM AND METHODS FOR USING SAME

James M. McMahan, Jr., and Roland G. Harper, Jr., both of Houston, Tex., assignors to Baroid Technology, Inc., Tex.

Continuation of Ser. No. 110,004, Oct. 19, 1987, abandoned. This application May 1, 1989, Ser. No. 346,245

Int. Cl.[4] H01B *1/00*

U.S. Cl. 137—1 **4 Claims**



3. A method for converting a hydraulically controlled BOP subsea system having a plurality of controllable functions, comprising:

(a) determining which of said functions is critical in controlling a blowout: and

(b) converted the hydraulic control of said critical functions to that of being electro-hydraulically controlled.

4,880,026

INTEGRATED FREE-STANDING VEHICLE DETAILING SERVICE CENTER

F. Budd Ferre; Rowell Sims; Wesley G. Bowen, and Vibert L. Kesler, all of Salt Lake City, Utah, assignors to Parapluie, Ltd., Baar, Switzerland

Filed Jul. 28, 1988, Ser. No. 226,269

Int. Cl.[4] B60S *3/00*

U.S. Cl. 137—234.6 **47 Claims**

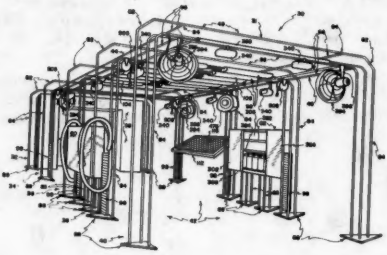
1. An integrated vehicle service center comprising:

three dimensional free-standing open framework means defining an unobstructed axially-accessible vehicle-receiving compartment, the framework means comprising a plurality of structurally interconnected frame means, each frame means comprising at least one column member on each side of the compartment and at least one beam member transversely bridging between the associated columns on each side of the compartment;

the framework means further comprising bearing means which rest unattached on the ground, floor or pavement and are associated with the lower end of at least some column member in load-transferring relation;

lighting means carried by the framework means comprising selectively illuminable light source means and means which directionally cause the source means to illuminate the compartment;

means where vehicle servicing products are disposed generally between column members;



means where vehicle servicing equipment is disposed during nonuse generally between the column members.

4,880,027

METHOD OF AND APPARATUS FOR REGULATING THE FLOW OF AT LEAST ONE GAS STREAM

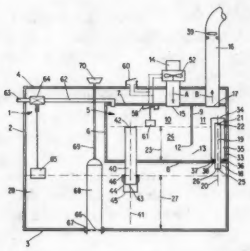
Heinrich Menge, Eissendorfer Pferdeweg 45, D-2100 Hamburg, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,292

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643043

Int. Cl.[4] E03D *9/05*

U.S. Cl. 137—247.25 **64 Claims**



4. Apparatus for regulating the flow of at least one gas stream, comprising a control chamber having a gas-admitting inlet and a gas-discharging outlet; means for supplying into said chamber a body of sealing liquid so that the liquid fills the chamber at most up to a predetermined level below said inlet and said outlet; means for establishing at least one passage for the flow of gas from said inlet to said outlet in response to a lowering of the liquid level in a portion at least of said chamber, including a partition which divides the interior of said chamber into a first compartment in communication with said inlet and a second compartment in communication with said outlet, said compartments communicating with each other by way of said passage in response to lowering of the liquid level in said first compartment; means for raising the pressure in said chamber in the region above said level so as to render the passage accessible to the at least one gas stream by lowering the liquid level in said portion of said chamber; and means for evacuating sealing liquid from said chamber in response to raising of the pressure in said chamber in the region above said predetermined level, said evacuating means having an intake which is located below said predetermined level when said pressure raising means is idle and which is located below said outlet, said pressure raising means including means for raising

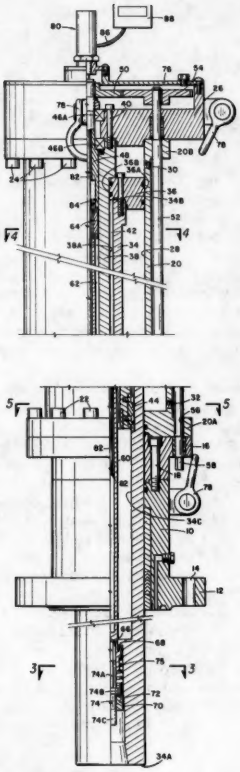
the pressure in said first compartment in the region above said predetermined level so that the liquid in said second compartment rises and enters said evacuating means.

4,880,028

COMPLETION MACHINE

Coy D. Osburn, and James B. Sullivan, both of Tulsa, Okla., assignors to TDW Delaware, Inc., Wilmington, Del.

Filed Feb. 3, 1989, Ser. No. 305,613
Int. Cl.[4] F16K *43/00*; F16L *55/12*
U.S. Cl. 137—315 **7 Claims**



1. For use in a pipeline plugging system having a plug receiving flange providing communication into the interior of a pipeline, a completion machine for attachment to the flange providing means to install or retrieve a plug from within the flange, comprising:

an elongated cylindrical housing having a flange means on the lower end adaptable to removably sealably engage a plug receiving flange and having therein a part a hydraulic cylinder having a fluid inlet and a fluid outlet port therein;

an elongated tubular control bar having an axial opening therethrough and reciprocally and non-rotatably received within said housing, the control bar having an upper and a lower end;

piston means secured to said control bar adjacent the upper end thereof and within said housing hydraulic cylinder providing means of longitudinally displacing said control bar by the application of hydraulic energy via said inlet and outlet ports;

a retention rod telescopically received within the upper end portion of said tubular control bar;

means externally of said housing of rotating said retention rod;

a retention rod extension having an upper end telescopically and non-rotatably received by said retention rod and having plug retaining means at the lower end thereof to attach

a plug therein, said plug retaining means being slidably and adjustably received within said retention rod extension during the displacement of said control bar; and

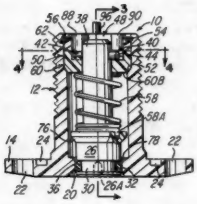
means to retain the lower end of said retention rod extension adjacent the lower end of said control bar as said control bar is reciprocated relative to said housing.

4,880,029

DRAIN VALVE

Floyd G. Koller, Dayton, Ohio, assignor to Auto-Valve, Inc., Montgomery County, Ohio

Filed Feb. 17, 1989, Ser. No. 312,748
Int. Cl.[4] F16K *31/528, 43/00*
U.S. Cl. 137—329.06 **4 Claims**



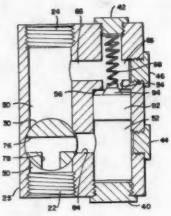
1. A lightning-protected fuel drain valve of the type having means forming a non-conductive plastic housing connectable to a fuel tank and having a port opening exteriorly of said housing and said fuel tank, a non-conductive plastic valve member guided for movement along an axis extending through said housing and said port between a first position wherein a lower end portion thereof closes said port and a second position wherein said lower end portion is raised to open said port, bias means operatively engaged with said valve member to bias said valve member in a direction along said axis that would extend said valve member downwardly of said port and said housing, cooperating stop means connected with said valve member for movement therewith and first abutment means fixed relative to said housing for preventing said valve member from passing downwardly out of said port, second abutment means fixed to said housing in confronting relation to said first abutment means and cooperating with said stop means for preventing said valve member from moving upwardly along said axis by a distance sufficient that said outer end portion moves away from said port to open the same unless said valve member is first rotated about said axis to maintain said valve member in a port-closed position in the event of a lightning strike, said bias means comprising a combined compression and torsion spring that torsionally biases said valve member into a position wherein said stop means is in interfering alignment with said first abutment means and in alignment with said second abutment means, and further abutment means cooperating with said stop means for preventing said torsion spring from unwinding when said valve member is in the port-closed position or a port-open position.

4,880,030

SAFETY FLOW CONTROL FLUID SHUTOFF DEVICE

Paul E. Terry, 23844 Via Jacara, Valencia, Calif. 91355

Filed Jul. 25, 1988, Ser. No. 224,048
Int. Cl.[4] F16K *17/30*
U.S. Cl. 137—460 6 Claims



1. A safety flow control device for stopping the flow of fluid therethrough when there is a break or leak in the flow path downstream of said device, comprising:

(a) a housing;

(b) an inlet port located in said housing for admitting fluid to said housing;

(c) an outlet port located in said housing for discharging fluid from said housing;

(d) a cylindrical valve chamber located in said housing, said cylindrical valve chamber having a first end and a second end, said first end of said cylindrical valve chamber being in fluid communication with said fluid inlet, said cylindrical valve chamber having a first cross-sectional area;

(e) washer-shaped sealing flange located at said second end of said cylindrical valve chamber;

(f) a safety flow channel located in said housing, said safety flow chamber having a first end and a second end, said safety flow channel having a second cross-sectional area smaller than said first cross-sectional area, said first end of said safety flow channel being in fluid communication with said second end of said cylindrical valve chamber, said second end of said safety flow channel being in fluid communication with said fluid outlet;

(g) a piston valve body located for reciprocating movement in said cylindrical valve chamber, said piston valve body having a plurality of longitudinally extending apertures therethrough, said apertures being blocked by said washer-shaped sealing flange when said piston valve body abuts said washer-shaped flange; and

(h) means for biasing said piston valve body away from said washer-shaped flange, said biasing means thereby allowing fluid entering said one end of said cylinrical valve chamber to flow through said apertures and into said safety flow channel, said piston being forced against said biasing means into contact with said washer-shaped flange when a break or leak in the flow path downstream of said device;

(i) wherein said piston valve body comprises a cylindrical element of a diameter which will closely fit in said cylindrical valve chamber, while remaining free to move in said cylindrical valve chamber in a reciprocating fashion;

(j) a segment extending from the end of said cylindrical element facing said washer-shaped sealing flange, with said segment having a frustroconical portion adjacent said cylindrical segment and a cylindrical portion at the end of said frustroconical portion away from said cylindrical element;

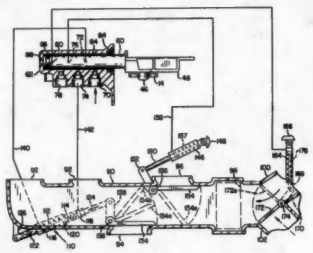
(k) wherein said apertures are located in said cylindrical element and are spaced away from said frustroconical portion.

4,880,031

HEATER AND AIR CONDITIONING CONTROL SYSTEM

Gabriel V. Fasolino, Portland, Oreg., assignor to Sprague Aristo-Aire, Inc., Wilsonville, Oreg.

Filed Apr. 27, 1988, Ser. No. 186,918
Int. Cl.[4] B60H *1/02*
U.S. Cl. 137—625.12 4 Claims



1. A heater and air conditioning control system for accomplishing multiple modes of operation of climate control means through the medium of compressed fluid and remote fluid pressure operated means, said control system comprising:

a control head comprising a body member having front and rearward ends and top and bottom portions,

mode control adjustment means on said body member movable between selected control positions,

a valve housing secured in a stationary position on said body member and having opposite ends and a cylinder area therein,

a first of said opposite ends of said housing facing said mode control adjustment means and having an opening communicating with said cylinder area,

stem means having an outer end secured to said mode control adjustment means and an inner end projecting through said opening and into said cylinder area,

a fluid pressure inlet communicating with said cylinder area,

a plurality of fluid pressure outlets all spaced along said cylinder area on the side of said fluid pressure inlet opposite from said end opening.

said fluid pressure outlets communicating with respective remote fluid pressure operated means,

and seal means consisting exclusively of a first seal at said opening to provide sealed sliding engagement of said stem means through said opening and a second seal on the inner end of said stem operating upon inward movement thereof by said mode control adjustment means to establish communication selectively between said fluid pressure inlet and one or more fluid pressure outlets.

4,880,032

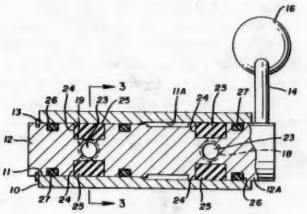
MULTIPLE PORT VALVE

Kingsley A. Doutt, P.O. Box 888, Alpena, Mich. 49707

Filed Jun. 20, 1989, Ser. No. 368,801
Int. Cl.[4] F16K *5/18, 11/085*
U.S. Cl. 137—625.19 6 Claims

1. An improvement in a multiple port valve having a valve body with a cylindrical bore therethrough, at least a pair of fluid flow passageways extending through said valve body intersecting said cylindrical bore transverse thereto and having outlets on one side of said bore and inlets on the opposite side of said bore, a cylindrical valve member rotatably positioned in said bore, secondary bores extending through said valve member forming parts of said passageways when said valve member is in a first position; the improvement comprising pockets in said valve member circumferentially spaced with respect to said secondary bores therein and positioned for registry with said passageways intersecting said cylindrical bore when said valve member is in a second position and compressed elastic

rubber plugs in said pockets for expansion into and sealing said passageways intersecting said cylindrical bore whereby said cylindrical valve member may be rotated from said first position with said secondary registering with said passageways to said second position with said elastic rubber plugs closing said passageways against a known fluid pressure within.

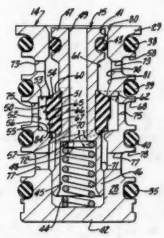


4,880,033

POPPET VALVE

James A. Neff, Birmingham, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

Filed Dec. 12, 1988, Ser. No. 282,752
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **2 Claims**



1. A three-way, normally closed, pilot air valve, including a valve body structure having a pressurized pilot air inlet port, a cylinder port, and an exhaust port, characterized in that:

(a) said valve body structure has an axial bore formed therethrough;

(b) a first passageway means is formed through the valve body structure and it connects said pressurized pilot air inlet port to the cylinder port;

(c) a second passageway means is formed through the valve body structure and it connects said exhaust port to the cylinder port;

(d) an upper, transverse, circular sharp edged poppet valve seat is formed in the axial bore, in the first passageway means, and a lower, circular inverted conical poppet valve seat is formed in the axial bore, in the second passageway means;

(e) a poppet valve spool is movably mounted in said axial bore and it is movable between a normally closed inoperative position and an open operative position;

(f) said poppet valve spool is provided with an upper, conical annular, valve member element and a longitudinally spaced apart lower, conical annular, valve member element, for sealing engagement with the upper, transverse circular sharp edged poppet valve seat and the lower, circular inverted conical poppet valve seat, respectively, so that when the poppet valve spool is in the normally closed inoperative position, the upper, conical annular, valve member element is seated on the upper, transverse circular sharp edged poppet valve seat and exerts a combined transverse and longitudinal sealing pressure thereon, and the poppet valve spool blocks communication through the first passageway means between the inlet port and the cylinder port through said axial bore while simultaneously the lower, conical annular, valve member element is in an unseated position, with communication open between the cylinder port and the exhaust port through said axial bore to allow the air under pressure entering said cylinder port to be exhausted out said exhaust port, and when the poppet valve spool is moved to the open operative position the lower, conical annular, valve member element is seated on the lower, circular inverted conical poppet valve seat and exerts a longitudinal sealing pressure thereon, and the poppet valve spool blocks communication through the second passageway means, to block exhaustion of air from the cylinder port to the exhaust port, and the upper, conical annular, valve member element is unseated to open communication between the pilot air inlet port and the cylinder port through the first passageway means to allow pressurized pilot air to flow from the pilot air inlet port to the cylinder port;

(g) the poppet valve spool is biased to the normally closed inoperative position by a return spring means engaged with the lower end of the poppet valve spool;

(h) the poppet valve spool is moved to the open operative position by a solenoid means;

(i) the upper, conical annular, valve member element has a periphery with a diameter larger than the diameter of the upper, transverse, circular sharp edged poppet valve seat, and the lower, conical annular, valve member element has a periphery with a diameter equal to the transverse, circular sharp edged poppet valve seat;

(j) the lower, conical annular, valve element has an angled valve seat engaging surface which commences at the lower end of the periphery thereof and angles downwardly and inwardly from a transverse plane, at an acute angle to form a circular corner on the lower, conical annular, valve element, which is the initial, circular contact portion of the lower, conical annular, valve element when it seats on the lower inverted conical valve seat;

(k) the diameter of the circular sharp edged valve seat, the diameter of the circular corner on the lower, conical annular, valve element, and the diameter of the axial valve spool bore are all equal to provide a balanced poppet valve spool when the poppet valve spool is in the inoperative and operative positions; and,

(l) the angled surface of the lower, circular inverted conical valve seat is formed downwardly and inwardly, from a transverse plane, to a larger acute angle than the acute angle valve seat engaging surface on the lower, conical annular, valve member element.

4,880,034

FLUID PRESSURE REGULATING APPARATUS

Shiro Takahashi, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,411
Int. Cl.[4] F15D *1/00*
U.S. Cl. 138—40 **11 Claims**

1. A fluid pressure regulating apparatus for regulating the pressure of a pressurized fluid supplied to a machine which uses the pressurized fluid as a driving source comprising:

a body having a fluid passage and means for connecting the fluid passage to pressurized fluid supplying means and the machine which uses the pressurized fluid as a driving source;

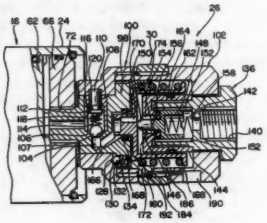
a valve seat formed in the fluid passage;

a valve body disposed in the fluid passage so as to be movable between (i) a closed position wherein the valve body is seated on the valve seat and (ii) an open position wherein the valve body is separated from the valve seat;

an actuator member movable between first and second posi-

tions in the fluid passage, wherein the actuator member, at the first position thereof, allows the valve body to move toward its closed position, and wherein the valve body is driven to its open position by the movement of said actuator member from the first position thereof to the second position thereof, said actuator member being urged towards the first position thereof by the pressure of the pressurized fluid in the fluid passage which is exerted upon the valve body and transmitted to the actuator member through the valve body;

a pressure regulating ring member provided on the outer surface of the body and rotatable around an axial center line of the body;



an urging force regulating member moveably mounted within said body;

urging means provided in the body and acting between said actuator member and said urging force regulating member; and

means for coupling said pressure regulating ring member to said urging force regulating member and for translating rotational movement of said pressure regulating ring about said axial center line of said body into movement of said urging force regulating member in a direction generally parallel to said axial center line, which generally parallel movement of said urging force regulating member, in turn, varies said urging force exerted upon said actuator member by said urging means.

4,880,035

PNEUMATIC BOLSTER FOR SEALING DAMAGED WALLS OF CONTAINERS AND PIPES

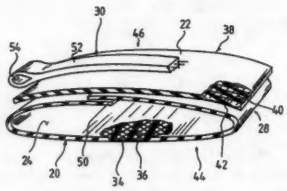
Manfred Vetter, Burg Langendorf, D-5352 Zülpich, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,980

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716918

Int. Cl.[4] F16L *55/16*

U.S. Cl. 138—99 **8 Claims**



1. In a sealing pad for sealing of damaged walls of containers and pipes exhibiting a leak which pad is manufactured from reinforced sections of rubber which prior to vulcanization is not vulcanized, said sections being joined by vulcanization in a press under heat, and form an air-tight inner chamber, a nipple being provided for having access to this inner chamber, said sealing pad being rectangular in shape, defining right-angled sides and having a pad-surface facing towards the leak and a pad-surface which faces away from the leak, both pad-surfaces having the same size and a rectangular shape, with the sealing pad also having on two opposite sides attachment components for a device for applying tension that encompasses the containers or pipes, wherein both the pad-surfaces are reinforced internally with flexible, linear reinforcing elements which bisect each other, the pad surface which is placed against the leak is reinforced solely with reinforcing elements which lie obliquely to the right-angled sides of the sealing pad, and the pad-surface which faces away from the leak has reinforcing elements which run parallel to the right-angled sides of the sealing pad.

4,880,036

HOSE FOR REFRIGERATING SYSTEMS

Tetsu Kitami, Hadano, and Jun Mito, Kanagawa, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

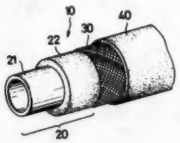
Filed Nov. 10, 1987, Ser. No. 119,175

Claims priority, application Japan, Nov. 13, 1986, 61-268517

The portion of the term of this patent subsequent to Apr. 26, 1989, has been disclaimed.

Int. Cl.[4] F16L *9/12*

U.S. Cl. 138—137 **3 Claims**



1. A hose suitable for use in transporting refrigerants comprising an inner tube including a resinous inner peripheral wall and a rubbery outer peripheral wall, a reinforcing layer laminated over said outer peripheral wall, and an outer cover laminated over said reinforcing layer, said inner peripheral wall being formed by a polymeric composition comprising 40–80 percent by weight of nylon-6 or nylon-6/66, 5–30 percent by weight of nylon-11 and 10–40 percent by weight of a polyolefin, said hose having an improved balance of flexibility, resistance to stress cracking and resistance to gas permeation rendering it suitable for use in refrigerating systems.

4,880,037

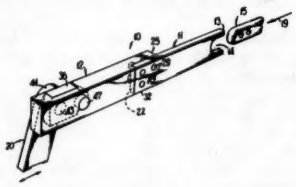
SHUTTLE RETURNER AND IMPROVED BODY THEREFOR

John W. Jenkins, Hampton, Ga., assignor to 501 Bellwether, Inc., Hampton, Ga.

Filed Nov. 30, 1988, Ser. No. 277,797

Int. Cl.[4] D03D *47/24*

U.S. Cl. 139—439 **17 Claims**



1. A body for a shuttle returner, comprising:

an elongate and relatively resilient body having a first end operative to receive a relatively inelastic shuttle receiving

member, and having a second end operative to receive an operating member which reciprocates the body; and

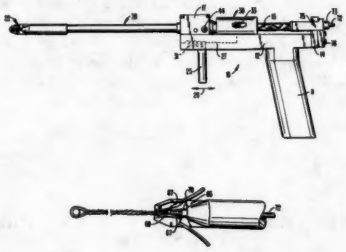
means associated with the resilient body to limit the elastic elongation of the body in response to tensile force imparted at the second end by the operating member in a direction tending to elongate the body, but not substantially limiting the elastic compression of the body in response to compressive force imparted at the first end by the shuttle receiving member.

4,880,038

WIRE TWISTING APPARATUS

Charles I. Meinershagen, Redding, Calif., assignor to NewTech Products, Inc., Palo Cedro, Calif.

Filed Jan. 21, 1988, Ser. No. 146,464
Int. Cl.[4] B21F *7/00, 15/04*
U.S. Cl. 140—93.6 **5 Claims**



1. A wire twisting apparatus capable of one-handed operation, said apparatus comprising:

a frame member having a handle adapted to be grasped by a hand of a user;

a shaft rotatably mounted on said frame member, said shaft having a wire receiving apertured tip portion, said apertured tip portion having an axial bore with a tapered wall region forming a seat, said tip portion having an axially extending open slot intersecting the aperture in the tip portion and extending longitudinally therefrom for a distance along said tip portion and of a depth which intersects the bore in the tip portion for enabling a pair of wire ends to be positioned between said plug means and said seat without requiring insertion through said apertured tip portion;

tapered plug means retractably received in said tip portion in the bore of normal contact with said seat, the tapers of said wall region and said plug means being substantially identical, said wall region and said plug means each having a taper angle lying in the range from about 5° to about 30°;

means mounted on said frame member for enabling retraction of said tapered plug means so that a pair of wire ends can be received between said plug means and said seat via said slot, said retraction enabling means including lever means coupled to said plug means and movably mounted on said frame member adjacent said handle portion so that said plug means can be manually retracted by the same hand grasping the handle, said retraction enabling means further including means for normally biasing said plug member toward said seat;

means mounted on said frame member for enabling rotation of said shaft; and

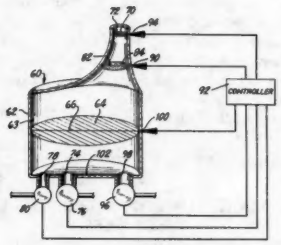
means for locking a pair of wire ends received between said plug means and said seat, said locking means including a roughened portion of said plug means and a roughened portion of said seat, each roughened portion having a ridged surface with peripherally extending contour lines.

4,880,039

INCREASING THE ACCURACY OF LIQUID VOLUME MEASUREMENTS UTILIZING LIQUID LEVEL SENSING

Vladimir Horak, 394 Taylor Ave., Hackensack, N.J. 07601

Filed May 25, 1989, Ser. No. 356,763
Int. Cl.[4] B65B *1/36*
U.S. Cl. 141—1 **10 Claims**



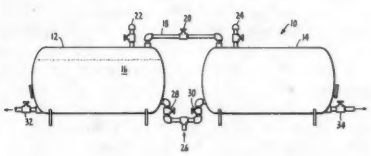
7. In the method for measuring a prescribed volume of liquid by flowing the liquid into a reservoir having a known volume located between a first level and a second level spaced a given distance above the first level, the reservoir further having a first cross-sectional area at the first level and a second cross-sectional area at the second level, and sensing the level of the liquid when the measured volume of liquid fills the known volume in the reservoir and the level of the liquid reaches the second level to determine that the measured volume of liquid is present in the reservoir, the improvement wherein the liquid is flowed into at least one portion of the reservoir lying between the first level and the second level for containing most of the measured volume of liquid, the at least one portion having a further cross-sectional area, and continuing to flow the liquid into the reservoir until the level of the liquid reaches the second level and the second cross-sectional area, the second cross-sectional area being substantially smaller than said further cross-sectional area of said at least one portion of the reservoir lying between the first level and the second level so that any slight deviation of the level of the liquid from the second level results in only a minimal deviation in the measured volume of the liquid from the prescribed volume of liquid.

4,880,040

LIQUID PETROLEUM CONFINEMENT SYSTEM

Raymond Pierson, 512 Mail Creek Ct., Fort Collins, Colo. 80525, and William Whiteley, Box 1722, Guymon, Okla. 73942

Filed Sep. 16, 1988, Ser. No. 245,817
Int. Cl.[4] B67C *3/00*; E21B *43/34*
U.S. Cl. 141—5 **1 Claim**



1. A method for collecting and maintaining oil containing pressurized components and thereafter distributing oil in equilibrium with atmospheric conditions which comprises:

a. providing a pair of storage tanks, each having an oil inlet below the top of the tank and a valved gas outlet at the top of the tank and a valved line connecting the tops of the two tanks;

b. passing oil containing pressurized gas through the oil inlet of the first of said tanks until the tank is nearly full of liquid oil and the oil is overlaid with pressurized gas filling the remainder of the tank;

c. opening said valved line to permit flow of gas from said first tank to the empty second tank of said pair of tanks until pressure in the two tanks is equalized and then closing said valved line;

d. ceasing passage of oil into said first tank and directing the oil into said second tank;

e. opening the gas outlet valve of said first tank to equalize tank pressure with atmospheric pressure;

f. withdrawing oil from said first tank until the tank is substantially empty; and

g. repeating steps (b) to (f) starting with the filled second tank.

4,880,041

APPARATUS FOR FLOWING AND FILLING LIQUIFIED INERT GAS

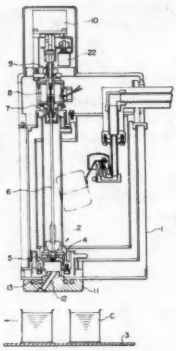
Morio Yamada, and Yoshihiko Kimura, both of Yokohama, Japan, assignors to Tokyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,267

Claims priority, application Japan, Apr. 15, 1987, 62-90643; Apr. 23, 1987, 62-98738

Int. Cl.[4] B65B *31/00*

U.S. Cl. 141—167 **2 Claims**



1. An apparatus for flowing liquefied gases from a liquefied gas storage tank for filling liquefied gases into cans, on a conveyor system, immediately before seaming of said cans, said apparatus comprising:

a valve device including a valve opening, formed in a bottom surface of a liquefied gas storage tank, and a needle fitted into said valve opening;

a valve device actuating solenoid having a plunger connected to an upper portion of said needle, said valve device actuating solenoid moving said needle upward and downward by attracting or releasing said plunger to open and close said valve opening;

a valve control rod which defines a stroke of said plunger;

a pulse motor for moving upward and downward said valve control rod to adjust an opening amount of said valve device;

a valve opening-degree detection means for detecting a position of said valve control rod to detect an opening degree of the valve device;

a line speed detector for detecting a line speed of said cans on a conveyor system and for generating a line speed signal; and

a control device for controlling an opening-degree of said valve device in response to said line speed signal from said line speed detector, said control device including

a central processing unit, and

high and low speed setting units and high and low valve opening-degree setting units in a paired relation for operating in a high line speed region and a low line speed region, said speed and valve opening-degree setting units inputting to said central processing unit a line speed/valve opening-degree conversion table for determining a valve opening-degree with respect to the line speed in a relationship which varies according to whether the line speed is in said high line speed region or said low line speed region,

wherein based upon said conversion table input by said speed setting units and said valve opening-degree setting units, an opening amount of said valve device is calculated by said central processing unit from a detected value of said line speed from said line speed detector, and said central processing unit compares a calculated opening amount with a detected value of said valve opening-degree detected by said valve opening-degree detection means, and said central processing unit inputting a drive signal to said pulse motor until said calculated value and ssid detected value coincide.

4,880,042

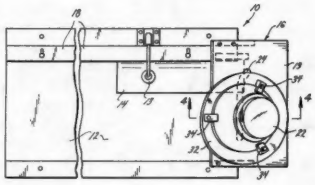
DEVICE FOR CUTTING MOLDING AND METHOD THEREFOR

Harvey W. Schafferkotter, 17200 Finch Path, Farmington, Minn. 55024

Filed Nov. 25, 1988, Ser. No. 276,126

Int. Cl.[4] B27C *5/10*; B27M *3/00*

U.S. Cl. 144—372 **6 Claims**



6. A method for cutting a segment of molding for angular mating with a second segment of molding, comprising:

holding a frst segment of molding on a table portion, said first segment of molding having a front face which is exposed when the first segment of molding is installed on a wall and a rear face which faces the wall and is hidden from view when the first segment of molding is installed on a wall; and

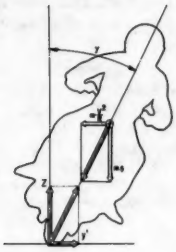
angularly cutting said first segment of molding with a cutting means extending through an opening in a template angularly mounted to said table, said cutting means being angled and said opening being shaped such that by tracing said opening with the cutting means, the first segment of molding may be cut at an angle such that the edge of said front face of said first segment of molding extends beyond said rear face of said first segment of molding and the edge of said front face which extends beyond said rear face corresponds to the outline of a corresponding front face of a second segment of molding to which said first segment is to be mated.

4,880,043

PAIR OF TIRES FOR TWO WHEELED VEHICLE

Francois Decima, Clermont-Ferrand, and Alain Rochon, Chateaugay, both of France, assignors to Michelin & Cie (Compagnie Generale des Etablissements Michelin), Clermont-Ferrand Cedex, France

Filed Feb. 4, 1988, Ser. No. 152,294
Claims priority, application France, Feb. 23, 1987, 87 02458
Int. Cl.[4] B60C 9/08, 9/22
U.S. Cl. 152—526 **3 Claims**



1. A pair of radial ply tires respectively mounted on the front and rear wheels of a motorcycle, comprising:

a rear tire including at least one belt having reinforcement threads oriented approximately parallel to an equatorial plane of said tire and positioned in a median zone of said rear tire, said rear tire having a slip angle $\delta 1$ as a given function of a camber angle γ, and

a front tire having a slip angle $\delta 2$ as a given function of a camber angle γ,

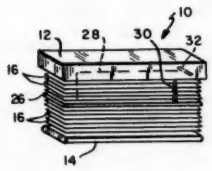
wherein the magnitude of difference $\delta 2 - \delta 1$ increases with an increase in the magnitude of γ.

4,880,044

SPACER DEVICES

Ren Judkins, Pittsburgh, Pa., assignor to BW-USA, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 32,623, Apr. 1, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 211,361
Int. Cl.[4] A47H 5/00
U.S. Cl. 160—84.1 **29 Claims**



1. A pleated shade having at least two bars, a piece of pleated material connected between the bars and cord means for controlling the opening and closing of the shade and for controlling the stacking thereof, a device for controlling the spacing between the bars, and thus the extent to which the pleats in the material are extended, comprising:

spacer means of predetermined length;

first means operative when the shade is in its fully open position for causing said spacer means to interact with both of said bars to limit the space therebetween; and

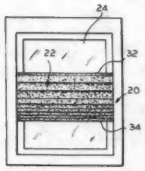
second means operative in conjunction with said cord means when the shade is in its fully closed position for limiting the extent to which said spacer means projects from a side of the shade.

4,880,045

WINDOW SHADE ASSEMBLY

Deborah L. Stahler, 801 Lear, New Lenox, Ill. 60451

Filed Mar. 18, 1988, Ser. No. 169,978
Int. Cl.[4] E06B 3/94
U.S. Cl. 160—84.1 **28 Claims**



19. A window shade assembly, comprising:

a flexible window shade sized to cover a window and formed to have a plurality of pleats therein, said flexible window shade being formed of a sheet-like material and each of said pleats being defined by a first fold portion and a second fold portion which together form a double fold, said flexible window shade being formed to have said pleats substantially from one end to the other end thereof;

a pair of guide tracks to be fixedly mounted to a frame of said window in spaced parallel relation, said guide tracks to extend generally perpendicular to the longitudinal direction of said pleats, said guide tracks also to be spaced by a distance sufficient for positioning said pleats therebetween;

each of said pleats having a projectable fold line between said first and second fold portions forming said double fold thereof, said projectable fold line being movable from a position generally corresponding to a plane defined by said guide tracks when said flexible window shade is closed to cover said window to positions gradually increasing in distance therefrom to a maximum projecting position as said flexible window shade is opened to reveal said window, each of said pleats also being integrally associated by means of a non-projectable fold line with the next adjacent of said pleats;

stiffening means associated with said projectable fold lines of each of said pleats, said stiffening means being defined by a loop formed in said sheet-like material at each of said projectable fold lines;

stiffening means associated with said non-projectable fold lines between each of said pleats, said stiffening means being defined by a loop formed in said sheet-like material at each of said non-projectable fold lines;

stiffening means associated with said ends of said flexible window shade, said stiffening means being defined by a loop formed in said sheet-like material at said ends of said flexible window shade;

retention means associated with said ends of said flexible window shade, said retention means being adapted to operate in cooperation with said guide tracks in a manner providing a resistance to movement only for said ends of said flexible window shade relative to said guide tracks sufficient to maintain both of said ends of said flexible window shade in any selected position of adjustment relative to said guide tracks, and slide means associated with opposite ends of every one of said non-projectable fold lines;

said slide means cooperating with said guide tracks for moving said non-projectable fold lines of said flexible window shade, said slide means comprising slide members captured in free-sliding fashion within said guide tracks so as to facilitate free-sliding movement of said flexible window

shade inwardly of said ends thereof for positioning said flexible window shade in any selected position of adjustment relative to said guide tracks in accordian-like fashion, said slide members maintaining said non-projectable fold lines of said flexible window shade in said plane defined by said guide tracks;

each of said loops in said sheet-like material at each of said ends of said flexible window shade being adapted to receive a dowel-like member, and including a dowel-like member in each of said loops in said sheet-like material at each of said ends of said flexible window shade to further define said stiffening means;

said retention means including a non-rotational slider operatively associated with opposite ends of each of said dowel-like members in each of said loops at said ends of said flexible window shade, said dowel-like members comprising conduit-like members and said non-rotational sliders each being disposed in captured sliding relation within one of said guide tracks, said non-rotational sliders also each being biased by a spring away from the respective one of said conduit-like members toward the corresponding one of said guide tracks;

one of said slide members being secured to each of said opposite ends of said non-projectable fold lines;

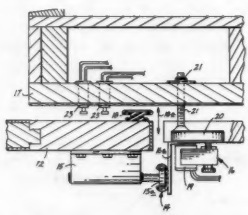
whereby said non-rotational sliders can be moved relative to said guide tracks to move said flexible window shade in accordian-like fashion from a closed position covering said window to an open position revealing said window by moving said ends of said flexible window shade against resistance to movement of said retention means relative to said guide tracks so as to be in close proximity at any point therealong.

4,880,046

DOOR SEALING APPARATUS

Jerry Gesy, R.R. #1, Lime Springs, Iowa 52155

Filed Sep. 26, 1988, Ser. No. 248,991
Int. Cl.[4] E05D *15/16*
U.S. Cl. 160—194 **1 Claim**



1. A door sealing apparatus comprising, in combination,

a reciprocating door vertically reciprocatable and slidably secured to a plurality of "L" shaped tracks, such "L" shaped tracks including a vertical portion and a horizontal portion where in said vertical portion said tracks are positioned proximate a door framework, and

motor means secured to each of said tracks for positioning said tracks relative to said framework, and

receiving means integrally secured to said framework for receiving a rotatable output shaft from said motor means to reposition said tracks relative to said framework, and

wherein said motor means comprise a rotatable motor and said rotatable output shaft is externally threaded, and

wherein said receiving means is internally threaded for receiving said rotatable output shaft for repositioning said door relative said framework, and

wherein said motor means is operably associated with a gear reduction means for increasing torque to said rotatable output shaft wherein said rotatable output shaft is upwardly secured to said gear reduction means, and

wherein at least one limit switch is positioned on said framework relative to said door limiting forward positioning of said door by said motor means, and

wherein said door includes a plurality of elongate seals for engagement with said framework, and

wherein said motor means is secured to said tracks by a bracket member, and

wherein said motor means comprise a plurality of reversible motors secured to each of said tracks, and

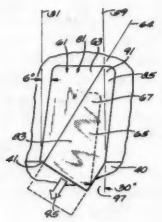
wherein said vertical portion of said track is telescoping receivable within a horizontal portion of said track, and each lowermost terminal end of said vertical track portion includes a pin receivable within a housing for guidingly receiving said track within said housing.

4,880,047

LOST FOAM TRANSFER PASSAGE CAVITY CONSTRUCTION

Russell J. VanRens, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 3, 1988, Ser. No. 202,489
The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.
Int. Cl.[4] B22C *7/02*
U.S. Cl. 164—45 **6 Claims**



5. A method of making a lost foam pattern for an engine block having a cylinder and a helical transfer passage which extends axially of the cylinder and which includes an undercut portion, said method comprising the steps of employing a die member to form a portion of the cylinder and a portion of the helical transfer passage, and employing a core supported by and movable relative to the die member between an extended position forming the undercut portion of the helical transfer passage and a retracted position clear of the undercut portion.

4,880,048

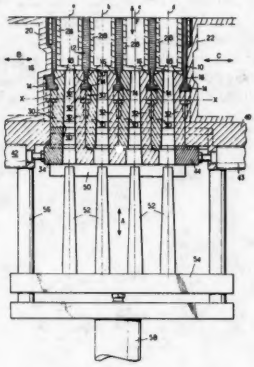
APPARATUS FOR THE MOULDING OF A CYLINDER BLOCK OR OF A CORRESPONDING FOUNDRY PATTERN

Michel Gaulard, Montbeliard, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly/Seine, both of France

Filed Sep. 8, 1988, Ser. No. 242,167
Claims priority, application France, Sep. 10, 1987, 87 12569
Int. Cl.[4] B22D *17/26*
U.S. Cl. 164—342 **6 Claims**

1. Apparatus for moulding a cylinder block, including several aligned cylinders with parallel axes and several bearings for mounting a rotary shaft, the axis of the shaft being perpendicular to the axes of the cylinders, several parallel partitions extending in planes perpendicular relative to the axis of the shaft for carrying the rotary shaft, the partitions having recesses preventing the cylinder block from being lifted in a direction parallel to the axis of the cylinders, wherein the moulding apparatus comprises two series of parallel and alternate moulding plates which extend in planes perpendicular relative to the axis of the shaft, each series of moulding plates being mounted

respectively on a support, means for sliding the supports parallel to the axis of the shaft in relation to the cylinder block between a moulding position and a lifting position, mutually confronting moulding faces of two consecutive plates bear



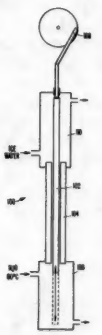
against one another in the moulding position, and the mutually confronting moulding faces being moved apart from one another toward the lifting position by the means for sliding of the supports.

4,880,049

HEAT TRANSFER SYSTEM WITHOUT MASS TRANSFER

Marc J. Jaeger, Gainsville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed May 26, 1988, Ser. No. 199,355
Int. Cl.[4] F28D *19/00*
U.S. Cl. 165—6 **11 Claims**



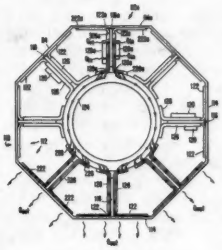
1. A heat-transfer system comprising:
a pair of zones adapted for positioning at respective locations of differing temperature between which it is desired to transfer heat;
at least a first element, one surface of which comprises a material which conducts heat;
at least a second element one end of which communicates with one of said pair of zones and the other end of which communicates with the other of said pair of zones, and, one surface of which comprises a material which conducts heat and is slidably engaged with said heat-conducting surface of said at least first element; and
means for establishing oscillatory movement of said at least second element between said pair of zones such that said heat-conducting heat-conducting surface thereof slidably engages said heat-conducting surface of said at least first element and such that said ends thereof do not communicate with the other of said pair of zones.

4,880,050

THERMAL MANAGEMENT SYSTEM

Gary D. Nakamura, Seattle, and Jerry D. Stephenson, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 20, 1988, Ser. No. 208,440
Int. Cl.[4] F28D *15/02*; B64G *1/50*
U.S. Cl. 165—41 **8 Claims**



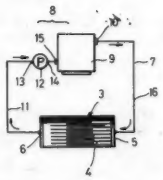
1. A thermal management system for cooling electronic equipment on spacecraft, comprising:
a plurality of pallets each having a radiator panel and a mounting panel, each of said radiator panels having an interior surface and an exterior surface, each of said mounting panels having a first end and a second end, said first end of said mounting panel being connected to said interior surface of said radiator panel for each of said pallets, said radiator panels of said pallets being connected end to end to enclose an interior space including said second ends of said mounting panels, said mounting panels having electronic equipment mounted thereon; and
cooling means for transferring heat from said mounting panel of one of said pallets to said radiator panel of another of said pallets.

4,880,051

PIPING APPARATUS FOR MELTING SNOW AND ICE

Kazuo Ohashi, Tokyo, Japan, assignor to Kabushiki Kaisha Patine Shokai, Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,771
Claims priority, application Japan, Jul. 14, 1986, 61-166504; Jul. 14, 1986, 61-166505; Oct. 22, 1986, 61-251052
Int. Cl.[4] F28D *17/00, 19/00*
U.S. Cl. 165—45 **19 Claims**



1. A piping apparatus for melting snow and ice, comprising:
a large number of elongated heat radiation pipes juxtaposed

adjacent to and beneath a surface from which snow and ice are to be melted and removed, said pipes being disposed substantially in parallel and substantially equidistantly with respect to one another in the longitudinal direction thereof and each of said heat radiation pipes having two opposite ends which are selectively inlet and outlet ends;

an inlet side header disposed in a direction substantially orthogonal to said elongated heat radiation pipes and being connected to an inlet end of each of said heat radiation pipes;

an outlet side header disposed in a direction substantially orthogonal to said elongated heat radiation pipes and being connected to an outlet end of each of said heat radiation pipes;

said elongated heating pipes and said inlet and outlet side headers forming a generally rectangular unit;

a feed pipe having first and second ends, said first end of which is connected to said inlet side header;

heating medium supply means including a heating medium generator and a pump, said heating medium supply means being connected to said feed pipe only at said second end of said feed pipe for supplying a heating medium to said heat radiation pipes via said feed pipe and inlet side header, and for causing said heating medium to flow through said heat radiation pipes under the influence of said pump; and

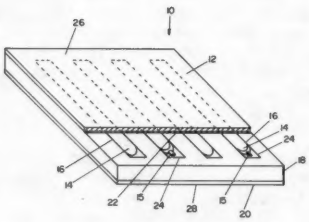
tubular heat retaining members storing therein an aqueous solution of sodium phosphate as a heat accumulation material, said tubular heat retaining members being disposed in the proximity of, and substantially in parallel with, at least a number of said heat radiation pipes.

4,880,052

HEAT PIPE COOLING PLATE

George A. Meyer, IV, Conestoga, and Robert F. Coleman, Lancaster, both of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Filed Feb. 27, 1989, Ser. No. 316,407
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.14 6 Claims



2. The thin walled cooling plate of claim 1 wherein the bonding means are solder sheets.

4,880,053

TWO-PHASE COOLING APPARATUS FOR ELECTRONIC EQUIPMENT AND THE LIKE

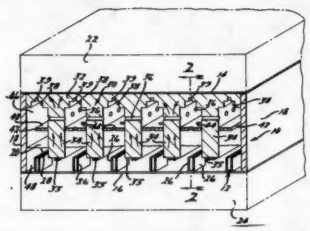
Sheyman: Vladimir, W. Bloomfield, Mich., assignor to The Board of Governors of Wayne State University, Detroit, Mich.

Filed Apr. 24, 1989, Ser. No. 341,903
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.26 36 Claims

15. A two-phase cooling device for transferring heat from an item to be cooled, said cooling device comprising:

a sealed enclosure having a generally hollow interior defined at least in part by first and second thermally conductive walls spaced apart from one another and by side walls interconnecting said first and second thermally conductive walls, said first thermally conductive wall being adapted for interconnection with the item to be cooled in a thermally conductive relationship therewith;

a wick structure disposed within said interior of said enclosure, said hollow interior and extending along at least a portion of said first thermally conductive wall in direct contact therewith for thermal conductivity therebetween, and a second wick portion protruding transversely from said wick portion, and extending through a substantial portion of said hollow interior, said second wick portion having a free end disposed generally adjacent said second thermally conductive wall;



said first wick portion having a generally hollow recess in an opposite side thereof from said first thermally conductive wall, said hollow recess opening into said hollow interior; and

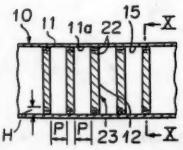
a thermally conductive liquid disposed within said hollow interior at a level above said free end of said second wick portion, said liquid being capable of being transported through said second wick portion and into said first wick portion wherein said liquid is evaporated by heat from the item to be cooled and condensed on the surfaces defined by said hollow recess in first wick portion and on the surface of said liquid.

4,880,054

HEAT EXCHANGER TUBE FOR EVAPORATION OR CONDENSATION

Takayuki Yoshida, Shizuoka; Masao Fujii, Chuo, and Kiyoshi Sakuma, Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 141,509, Jan. 7, 1988, Pat. No. 4,794,983.
This application Sep. 7, 1988, Ser. No. 241,477
Claims priority, application Japan, Feb. 2, 1987, 62-22113
Int. Cl.[4] F28F *13/00*
U.S. Cl. 165—133 1 Claim



1. A heat exchanger tube for evaporation or condensation, said heat exchanger tube comprising:

(a) projected parts having cavities in which bubble nuclei form, said projected parts being provided on at least one of the inner wall surface and the outer wall surface of a tubular body, and

(b) plain parts formed on the same surface as the projected parts so that the projected parts and the plain parts are interspersed,

wherein:

(c) the projected parts and the cavities comprise a stranded wire made of a plurality of wires and

(d) the projected parts are provided on the wall surface so that the intervals P between the projected parts and the height H of the projected parts satisfy the following expressions:

$P \leqq 4d$, $10 \leqq P/H \leqq 20$

wherein d represents the diameter of a bubble nucleus.

4,880,055

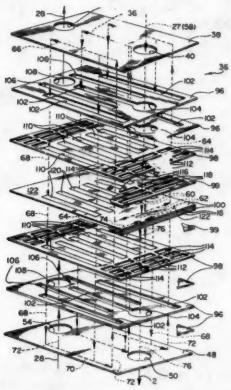
IMPINGEMENT PLATE TYPE HEAT EXCHANGER

Richard E. Niggemann, and Dam C. Nguyen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 7, 1988, Ser. No. 280,956

Int. Cl.[4] F28F *3/00*

U.S. Cl. 165—167 **21 Claims**



1. An impingement plate type heat exchanger for exchanging heat between at least first and second fluids, comprising:

a stack of generally parallel plates wherein:

at least one plate at an end of the stack defines a first inlet for the first fluid;

at least one plate at an end of the stack defines a first outlet for the first fluid;

at least one plate at an end of the stack defines a second inlet for the second fluid;

at least one plate at an end of the stack defines a second outlet for the second fluid;

a plurality of plates between opposite ends of the stack form impingement orifice plates defining first and second tortious flow paths generally parallel to each other and generally perpendicularly through the plates for the first and second fluids, respectively; and

a plurality of plates between opposite ends of the stack form manifold plates defining flow paths for distributing the first fluid from the first inlet through the first tortious flow path to the first outlet and distributing the second fluid from the second inlet through the second tortious flow path to the second outlet.

4,880,056

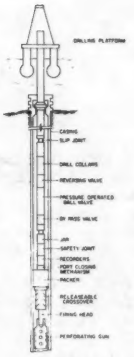
HYDRAULICALLY ACTIVATED FIRING HEAD FOR WELL PERFORATING GUNS

John A. Nelson, Spring, and Gregg W. Stout, Montgomery, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Division of Ser. No. 94,275, Sep. 8, 1987, Pat. No. 4,817,718. This application Jul. 11, 1988, Ser. No. 217,703

Int. Cl.[4] E21B *43/04*

U.S. Cl. 166—51 **3 Claims**



1. A cross-over and release mechanism for use in a subterranean well to support other tools from a tubing-carried, retrievable packer settable at any selected location in the well, said packer having a central bore, comprising: a hollow body element sealingly secured to the other tools, said hollow body element defining a central fluid passage communicating at its upper end with said packer bore; said hollow body element also defining at least one radial fluid passage communicating between said central fluid passageway and the well annulus surrounding said body element, whereby the fluid pressure in the well annulus below the set packer is controlled by the fluid pressure in the tubing; a thin-walled tube secured to the upper end of said body element and projecting upwardly through the packer central bore in inwardly spaced relation to the packer bore wall, thereby defining an axially extending bypass fluid passage through the packer; port means connecting the upper end of said bypass fluid passage to the well annulus above the set packer; said hollow body element further defining an axially extending passage connecting said bypass fluid passage to the interior of said other tools; releasable latch means securing said body element to said packer; and means responsive to tubing pressure for releasing said latch means, thereby leaving said cross-over tool and said other tools in the well when the packer is retrieved.

4,880,057

PROCESS FOR REMOVING CARBONATE FROM WELLS

Richard W. Derowitsch, 956 Dixie Beach Blvd., Sanibel, Fla. 33957

Continuation-in-part of Ser. No. 46,587, May 4, 1987, Pat. No. 4,778,006. This application Oct. 17, 1988, Ser. No. 259,016

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

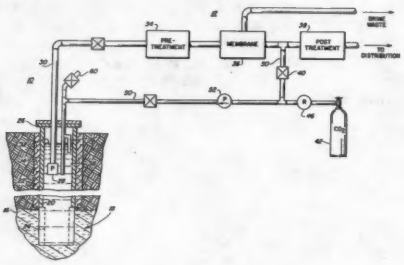
Int. Cl.[4] E21B *43/27*

U.S. Cl. 166—267 **6 Claims**

1. A method of removing carbonate deposited in a water supply well by inflowing groundwater, comprising the steps of:

treating a supply of water by means of a membrane system for desalinization which places the water in an aggressive

state of chemical inequilibrium and ion imbalance having a keen affinity for carbonate;



pumping a fluid comprising the treated supply of water, without restabilization, into the well to react with the deposited carbonate; and

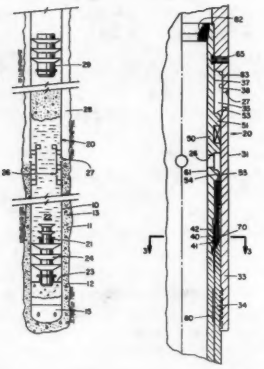
flushing the product of the reaction from the well.

4,880,058

STAGE CEMENTING VALVE

Hiram E. Lindsey, Midland, and Richard W. Adams, Bryan, both of Tex., assignors to Lindsey Completion Systems, Inc., Midland, Tex.

Filed May 16, 1988, Ser. No. 194,132
Int. Cl.[4] E21B *33/16, 34/14*
U.S. Cl. 166—289 **15 Claims**



9. A method for stage cementing a string of pipe in a well bore where the string of pipe includes a stage valve having a tubular valve collar intermediate of its length and has a tubular sleeve valve member slidably received in said stage collar for movement between first and second longitudinal positions relative to said stage collar and where said sleeve valve member has a flange in engagement with an engagement surface on said valve collar in said first longitudinal position and where said sleeve valve member has a piston portion located in an annular chamber between said sleeve valve member and said valve collar and where said sleeve valve member has a sleeve valve port with access to one surface of said piston portion in said annular chamber for placing said one surface in fluid communication with the bore of said sleeve valve member and said valve collar has a valve collar port with access to the other surface of said piston portion in said annular chamber for placing said other surface in fluid communication with the exterior of the valve collar, and said piston portion separates said sleeve valve port from said valve collar port in a said first longitudinal position and permits said ports to be in fluid communication with one another in an said second longitudinal position, the method including the steps of:

positioning the string of pipe and stage collar in a well bore;

introducing a first cement slurry to the bore of the string of pipe where the first cement slurry is followed by a wiper plug and the cement slurry is for cementing a lower annulus between the string of pipe and the well bore from the bottom of the well bore to the stage collar while the ports are separated by said piston portion;

closing off the bore of the string of pipe below the stage collar and applying hydraulic pressure to the fluid in the string of pipe to shift the flange on said sleeve valve member upwardly from said engagement surface by the hydraulic pressure in the stage collar and in the string of pipe to said second longitudinal position and to place said valve collar port in fluid communication with said sleeve valve port;

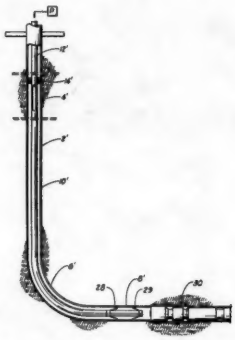
introducing a second cement slurry to the stage collar through said ports for cementing an annulus from the stage collar to the top of the string of pipe.

4,880,059

SLIDING SLEEVE CASING TOOL

John T. Brandell, and Richard L. Giroux, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 12, 1988, Ser. No. 231,737
Int. Cl.[4] E21B *34/06, 34/14*
U.S. Cl. 166—332 **8 Claims**



1. A sliding sleeve casing tool installed in a string of casing in a well bore intersecting a plurality of formations of the earth, said sliding sleeve casing tool for use in evaluating the characteristics of a formation surrounding said sliding sleeve casing tool of said plurality of formations, said sliding sleeve casing tool capable of being repeatedly opened and closed any desired number of times to allow fluids to be selectively produced from said formation and, if desired, fluids to flow from said casing into said formation when apertures allowing fluid communication between the exterior and interior of said sliding sleeve casing tool have been created therein, said sliding sleeve casing tool comprising:

an annular housing secured in said string of casing at a desired location for evaluating the characteristics of said formation, the annular housing having a longitudinal axis therethrough;

a sliding sleeve slidable within the annular housing from first desired location to a second desired location therein, the sliding sleeve having a longitudinal axis therethrough substantially parallel to the longitudinal axis of the annular housing and forming an annulus between the annular housing and the exterior of the sliding sleeve;

cup-type seal members retained on the sliding sleeve to

slidingly, sealingly engage the interior of the annular housing to prevent fluid flow in either direction longitudinally in the annulus formed between the annular housing and the sliding sleeve;

first releasable retaining means attached to the sliding sleeve to allow the sliding sleeve to be releasably retained at a second desired location in the annular housing; and

second retaining means extending between the annular housing and the sliding sleeve to allow the sliding sleeve to be initially retained within the annular housing in a first position therein;

whereby when apertures have been formed in the annular housing after the installation of said sliding sleeve casing tool in said string of casing and said string of casing is installed in said well bore to allow fluid communication between the interior of the annular housing and the exterior thereof, the sliding sleeve may be repeatedly moved between the first location and the second location in the annular housing so that when the sliding sleeve is in its first location, the sliding sleeve seals the interior of the annular housing to prevent fluid communication from the exterior of the annular housing to the interior of the sliding sleeve thereby preventing the flow of fluids from the formation into said casing and when the sliding sleeve is in its second desired location, the sliding sleeve allows fluid communication from the exterior of the annular housing to the interior of the sliding sleeve thereby allowing fluids to be selectively produced from said formation and, if desired, fluids to flow from said casing into said formations.

4,880,060

VALVE CONTROL SYSTEM

Kenneth L. Schwendemann, Lewisville, and Timothy J. Noack, Grapevine, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 31, 1988, Ser. No. 238,741
Int. Cl.[4] E21B *7/12, 34/04*
U.S. Cl. 166—336 **20 Claims**

1. A system for testing an underwater well, said system comprising:

(a) a test pipe string in said underwater well, said string having an upper section and a lower section;

(b) a hydraulically operated retainer valve in said upper seetion;

(c) a control system housing in said upper section;

(d) control manifold means for operating said control system and said retainer valve, said control manifold means comprising:

(a) a source of pressure;

(b) a gas charged accumulator;

(c) a directional control valve; and

(d) conduits conducting pressurized fluid from said pressure source to said accumulator and from said accumulator to said shut-off valve;

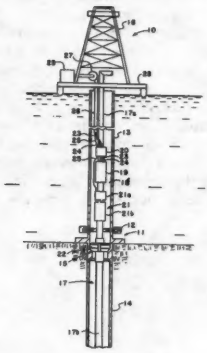
(e) hydraulic control system means in said housing for controlling said retainer valve, said hydraulic control system means conducting well pressure from said test pipe string to said retainer valve for quickly closing said retainer valve and locking said retainer valve closed, said hydraulic control system means comprising:

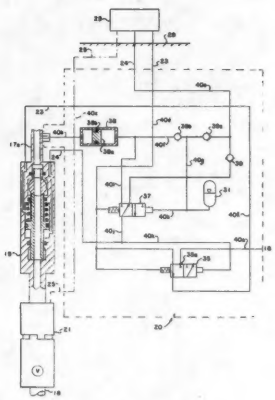
(a) a normally closed pilot valve;

(b) a flow passage for conducting a pressure pulse from the accumulator to the pilot valve for opening the pilot valve;

(c) a flow passage for conducting fluid from the inside of the test pipe to said pilot valve; and

(d) a flow passage for conducting fluid from said pilot valve to said retainer valve for closing said retainer valve and locking said retainer valve closed; and





(f) control conduit means for conducting control fluid between said control manifold and said housing and between said housing and said valve.

4,880,061

TOOL FOR RUNNING STRUCTURES IN A WELL

Arthur G. Ahlstone, Ventura, Calif., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Division of Ser. No. 3,117, Jan. 14, 1987, Pat. No. 4,736,799.
This application Oct. 14, 1987, Ser. No. 108,377
Int. Cl.[4] E21B *23/00, 33/043*
U.S. Cl. 166—348 **7 Claims**

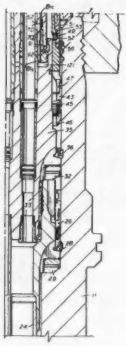
1. A running tool for running a tubing hanger and packoff assembly into a subsea wellhead housing and setting the packoff assembly between the tubing hanger and wellhead housing, comprising:

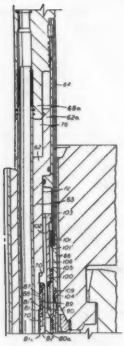
an upper member having an upper generally tubular cyclindrical body with a reduced diameter portion at its lower end, and a downwardly extending surrounding sleeve disposed on said body around said reduced diameter portion and extending beyond the lower end of said body, there being an annular space between said reduced diameter portion and said surrounding sleeve;

a lower member having a lower generally tubular cylindri-

cal body with an upper end portion telescopingly received in said annular space and a lower body portion;

said lower body portion having an upper portion having a large outer diameter surface, said large outer diameter surface being reduced in outer diameter from said upper end portion, said lower body portion having an intermediate portion having an intermediate outer diameter surface positioned below said large outer diameter surface and having a further reduced outer diameter surface, and said lower body portion having a lower third portion having a lower small outer diameter surface positioned below said intermediate outer diameter surface and having a smaller outer diameter than said intermediate outer diameter, said lower member being substantially entirely received in said surrounding sleeve of said upper member;





packoff setting means disposed on said member for moving said upper body and surrounding sleeve downward with respect to said lower body for engaging and setting the packoff assembly;

packoff latching means slidably mounted on said surrounding sleeve, between said surrounding sleeve and said lower body portion, for releasably attaching said surrounding sleeve to the packoff assembly;

a tubular member threadedly engaged with a portion of said lower outer small diameter surface of said lower third portion of said lower body portion of said lower member, and positioned about and in contact with said lower outer small diameter surface, and partially surrounded by slidable tubing hanger latching means, said slidable tubing hanger latching means being slidably mounted on said intermediate outer diameter surface, and being positioned about a portion of said lower third portion, between said lower small outer diameter surface and said packoff latching means, for releasably attaching said lower small outer diameter surface and said tubular member to the tubing hanger;

hydraulic system means connected to said packoff setting means, with said packoff latching means and said tubing hanger latching means being used for actuating the packoff setting means, and for moving the packoff latching means and the tubing hanger latching means into and out of attachment with the packoff assembly and the tubing hanger, respectively.

4,880,062

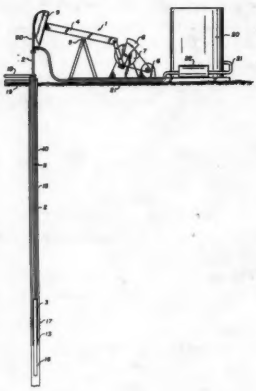
OIL WELL DOWNHOLE LIQUID INJECTION ASSEMBLY

Linden Bland, Calgary, and Clifford J. Anderson, Sherwood Park, both of Canada, assignors to Murphy Oil Company Limited, Calgary, Canada

Filed Jul. 20, 1987, Ser. No. 75,566

Int. Cl.[4] E21B *43/00, 34/12;* F04B *21/00*

U.S. Cl. 166—371 **6 Claims**



1. A method for reducing gas locking of an oil well downhole reciprocating pump seated in a well, said well being equipped with an outer tubing string and an inner tubular rod string connected with the pump for reciprocating the pump, said pump having a tubular barrel, seated in the tubing string and forming an internal barrel chamber, a plunger assembly comprising a hollow plunger disposed in the barrel chamber and a tubular plunger rod extending into the barrel chamber and being connected with the plunger, said plunger assembly communicating with the barrel chamber and being connected with the rod string to form therewith a reciprocating unit, said rod string being connected at surface with means for injecting liquid thereinto, and a valve assembly connected into and forming part of the reciprocating unit above the plunger rod, said valve assembly being adapted to control liquid flow through the unit into the barrel chamber, and a stop member carried by the tubing string or the pump barrel and positioned to contact the valve assembly when the rod string is at about the bottom of its downstroke,

said method comprising:

injecting liquid into the rod string;

opening the valve assembly, when the rod string is at about the bottom of its downstroke, by bringing said valve assembly, as a result of its movement with the rod string, into contact with the stationary stop member, to thereby

initiate liquid flow into the barrel chamber from the rod string; and

closing the valve assembly, as the rod string rises on the upstroke, in response to removing said valve assembly out of contact with the stop member, to thereby terminate liquid flow into the barrel chamber from the rod string;

whereby some substantially incompressible liquid is introduced into the barrel chamber so as to be present there during the upstroke, to thereby reduce gas locking of the pump.

2. An assembly for pumping an oil-producing well having a well bore, comprising:

a tubing string installed in the well;

a downhole pump seated in the tubing string;

a reciprocable tubular rod string, positioned in the tubing string, for actuating the pump, said rod and tubing strings forming a tubing annulus between them;

means, connected with the rod string at ground surface, for reciprocating said rod string;

means, connected with the rod string at ground surface, for injecting liquid into the bore of the rod string;

said pump comprising

a tubular open-bottomed barrel forming an internal chamber,

a hollow plunger positioned in the barrel chamber in slidable sealing engagement with said barrel's inner surface, said plunger closing off the lower end of the chamber,

a travelling valve assembly, carried by the plunger, for controlling and enabling fluid to flow from the well bore through the plunger into the barrel chamber on the down stroke of the rod string, said travelling valve assembly being adapted to close at the start of the upstroke and to open again at the start of the downstroke, and

a tubular plunger rod connected with the plunger to form a plunger assembly, said plunger assembly communicating with the barrel chamber and being connected with the rod string to form a reciprocating unit;

a standing valve assembly, having parts mounted on each of the reciprocating unit and the upper end of the barrel, said assembly being operative to permit fluid to flow from the barrel chamber into the tubing annulus on the upstroke of the rod string;

a valve assembly, being interconnected with and forming part of the reciprocating unit above the plunger rod, said valve assembly being convertible between an open position, in which liquid injected into the rod string bore may pass through the valve assembly into the plunger rod bore and the barrel chamber, and a closed portion, in which liquid in the rod string bore is blocked from moving into the barrel chamber;

a stationary stop member carried by one of the barrel or the tubing string;

said valve assembly including a movable first member arranged to contact the stop member, when the rod string is approaching the bottom of its downstroke, to open the valve assembly in reaction to said contact and the concomitant stopping of the first member's movement, said valve assembly being operative to automatically close when the first member is removed from contact with the stationary stop member by the upward movement of the reciprocating unit on the upstroke;

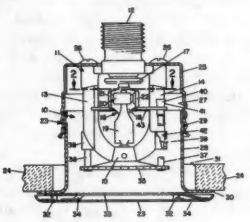
whereby some liquid may be introduced, through the rod string, valve assembly and plunger rod, into the barrel chamber in conjunction with the bottoming of the stroke, to reduce gas locking of the pump.

4,880,063

ADJUSTABLE CONCEALED SPRINKLER

Ernest Leininger, Northport, N.Y.; Leonard Blum, Montvale, and Gary W. Ponte, West Orange, both of N.J., assignors to The Reliable Automatic Sprinkler Co., Inc., Mount Vernon, N.Y.

Filed Apr. 13, 1987, Ser. No. 37,469
Int. Cl.[4] A62C *37/08, 37/14*
U.S. Cl. 169—37 7 Claims



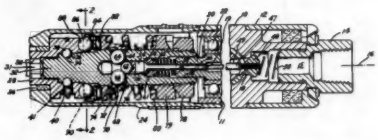
1. A sprinkler for use in a fire extinguishing system comprising frame means having an inlet opening for fire extinguishing liquid and spaced arms extending from the inlet opening to provide a support at a location spaced from the inlet opening, a cap normally covering the inlet opening, thermally responsive strut means extending between the support and the cap and normally retaining the cap in position over the inlet opening, deflector means slidably supported from the frame means by a plurality of pins having heads with tapered surfaces, tapered socket means associated with the frame means to receive the tapered surfaces of the pin heads in close fitting relationship when the deflector is in the extended position, and spring means engaging one of the pin heads and the strut means to normally retain the deflector means in retracted condition while urging the strut means in a direction away from the frame means.

4,880,064

TORQUE SENSING, AUTOMATIC SHUT-OFF AND RESET CLUTCH FOR SCREWDRIVERS, NUTSETTERS AND THE LIKE

Robert Willoughby, Washington, and Phil D. Thorp, Bryan, both of Ohio, assignors to The Aro Corporation, Bryan, Ohio

Filed Nov. 5, 1987, Ser. No. 117,156
Int. Cl.[4] B25B *23/145*
U.S. Cl. 173—12 6 Claims



1. In a fluid powered tool of the type including a housing with a forward end, and intermediate section and a rear end, a fluid driven motor in the housing with a rotary output shaft defining an axis of rotation, a fluid inlet to the motor, a valve member cooperative with the fluid inlet to control fluid flow to the motor, a bit holder for a tool bit at the forward end of the tool and a clutch mechanism intermediate section and connecting the output shaft with the bit holder, the output shaft, bit holder and clutch mechanism being substantially coaxial, the improvement comprising, in combination:

a torque responsive, fluid flow start, shut-off and reset mechanism incorporated in the clutch mechanism, said torque responsive mechanism including:

(a) means for support of the bit holder in the housing to permit both rotary and axial movement;

(b) a driving clutch member keyed at one end to the output shaft for simultaneous rotation with the output shaft and attached at its opposite end to the bit holder to permit simultaneous axial movement with the bit holder and independent rotary movement relative to the bit holder;

(c) clutch engaging means for mechanically connecting the driving clutch member to the bit holder for simultaneous rotary movement, said means including at least one biased roller member intermediate the clutch member and the bit holder, said roller member radially spaced from the axis of rotation and axially movable with respect to one of the driving clutch member and bit holder, said roller member biased by roller member biasing means into a receiving pocket of the other of the driving clutch member and bit holder during rotary driving operation of the tool below a torque threshold, said roller member axially translatable from said receiving pocket during driving operation of the tool above said torque threshold whereby the bit holder and driving clutch member rotationally disengage;

(d) an axial counterbore in the driving clutch member extending from the motor output shaft;

(e) a valve control rod in the counterbore having a forward end and mechanically connected at the other end to the valve member;

(f) valve control rod biasing means for axially biasing the valve member and the valve control rod toward a valve member closed position;

(g) driving clutch member biasing means in the axial counterbore of the driving clutch member for biasing the driving clutch member axially toward the forward end relative to the output shaft;

(h) a radial passage in the driving clutch member intersecting the counterbore;

(i) a radially displaceable member in the radial passage cooperative with the forward end of the valve control rod;

(j) an axially displaceable sleeve over the driving clutch member radial passage, said disposable sleeve having first and second radial limiting means both cooperative with the radially displaceable member to control the position of said radially displaceable member in the radial passage to thereby control the axial position of the valve control rod in the counterbore; and

(k) sleeve biasing means for normally biasing the sleeve to a first radial limiting position corresponding to engagement with the first radial limiting means wherein the valve control rod is extended axially toward a valve open position;

whereby to start the motor by opening the valve member the bit holder is axially translated rearwardly against the force of the value control and biasing means and the driving clutch member biasing means as the driving clutch member and bit holder are rotationally engaged, and the sleeve is in the first limiting position to hold the valve control rod in the rearward position and cause the valve member to open;

whereby to control torque the rotatably connected driving clutch member and bit holder are disengaged when the torque threshold is exceeded and the roller member is axially translated rearwardly against the force of the ball members biasing means to simultaneously translate the sleeve to the second limiting position thereby permitting the radially displaceable member to move radially outward in the passage and release the control rod for movement toward the forward end and close the valve member to terminate operation of the motor; and

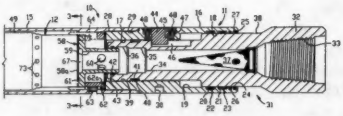
whereby to reset the mechanism, release of axial force on the bit holder permits the bit holder and shaft to move axially forward in response to drive clutch member biasing means and the sleeve biasing means to effect subsequent radial movement of the radially displaceable member to the first limiting position.

4,880,065

AIR MOTOR OPERATED ROTARY EARTH DRILLING TOOL

William J. McDonald; Michael R. Wasson; Curtis E. Leitko; Gerard T. Pittard, and William C. Maurer, all of Houston, Tex., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 14, 1988, Ser. No. 258,175
Int. Cl.[4] E21B *4/02*; F03B *13/02*
U.S. Cl. 175—71 **29 Claims**



1. An air motor operated rotary earth drilling tool, for use with a source of high pressure, high volume compressed air, comprising

a circulation control housing, a motor housing, a reduction gear housing, and a bearing housing connected longitudinally in series,

said circulation control housing having an inlet for connection to a source of high pressure, high volume, compressed air, an outlet opening into said motor housing, and an exhaust opening for discharge of compressed air for flushing cuttings and debris from a bore hole,

said motor housing having an inlet connected to receive compressed air from said circulation control housing outlet, a motor chamber, an air motor rotor positioned therein with a rotary shaft extending into said reduction gear housing, and outlet opening for discharge of compressed air from said rotary air motor to said reduction gear housing,

a reduction gear train supported in said reduction gear housing receiving said air motor rotor shaft and having a low speed, high torque output shaft extending into said bearing housing,

said reduction gear housing having an inlet operatively connected to said motor housing outlet, an outlet connected to discharge compressed air to said bearing housing, and a passageway conducting compressed air around said reduction gear train in heat exchange relation therewith,

said bearing housing having an inlet operatively connected to receive compressed air from said reduction gear housing,

bearing means in said bearing housing supporting said reduction gear train output shaft for rotary movement,

a hollow, rotary drill bit sub extending into said bearing housing and supported on said bearing means for rotation by said reduction gear train output shaft,

said hollow, rotary drill bit sub having a passageway open to discharge compressed air from said motor and reduction gear housings to a bore hole in which the drilling tool is operated,

said bearing housing having an opening permitting flow of part of said compressed air through said bearing means to discharge into a bore hole in which the drilling tool is operated, and

valve means in said circulation control housing controlling said exhaust opening on longitudinal movement of said circulation control housing to direct flow of compressed air selectively to said motor housing or to said exhaust opening to split the flow of air through said bearing housing to flow part through the bearing means and part through said hollow, rotary drill bit sub.

4,880,066

ASSEMBLY FOR DIRECTIONAL DRILLING OF BOREHOLES

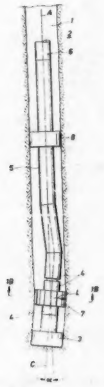
Abe Steiginga, and Robert N. Worrall, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1988, Ser. No. 147,402

Claims priority, application United Kingdom, Apr. 13, 1987, 8708791

Int. Cl.[4] E21B *4/02, 7/08, 17/10*

U.S. Cl. 175—75 **25 Claims**



1. A drilling assembly for directional drilling of boreholes in subsurface formations, the assembly comprising

a downhole drilling motor, said motor having an output shaft which is suitable to drive a rotary drill bit and a motor housing which is suitable to be arranged at the lower end of a drill string;

stabilizing means for stabilizing the assembly;

means in the assembly for permanently tilting the central axis of the output shaft with respect to the longitudinal axis of the drill string in the borehole;

characterized in that said stabilizing means include a lowermost stabilizer which is secured to and rotates with said output shaft.

4,880,067

APPARATUS FOR DRILLING A CURVED BOREHOLE

Henk H. Jelsma, Spring, Tex., assignor to Baroid Technology, Inc., Houston, Tex.

Filed Nov. 14, 1989, Ser. No. 156,831

Int. Cl.[4] E21B *7/06, 17/20*

U.S. Cl. 175—107 **8 Claims**

1. A drill string for drilling a curved borehole, wherein said drill string has a plurality of cylindrical sections, each of said sections having a longitudinal axis and also having an upper end and a lower end, comprising:

a first of said drill string sections having first and second surfaces on the said lower end of said first section; and

a second of said drill string sections having first and second surfaces on the said upper end of said second section, said first surfaces being parallel to each other and perpendicular to each said longitudinal axis and an angle being formed between said second surfaces.

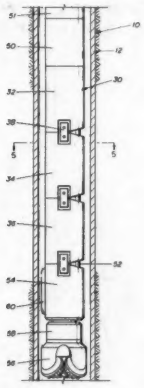
6. A drilling system for drilling a curved borehole, comprising:

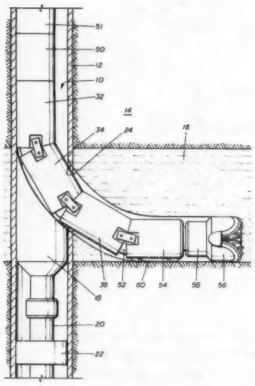
a drill string having a plurality of independent cylindrical sections pivotally connected together;

a PDM motor in said drill string;

a drill bit in said drill string;

a steel-lined neoprene hose for delivering drilling fluid from said motor to said drill bit; and





a flexible drive shaft connected between said motor and said drill bit, said independent sections having the ability to bend only in a single direction while said system is drilling said curved borehole.

4,880,068

ROTARY DRILL BIT LOCKING MECHANISM

Charles L. Bronson, Brownsville, Tex., assignor to Varel Manufacturing Company, Dallas, Tex.

Filed Nov. 21, 1988, Ser. No. 273,554

Int. Cl.[4] E21B *10/22*

U.S. Cl. 175—369 **8 Claims**

1. A rotary drill bit locking mechanism comprising:

a cutter cone having a bearing surface,

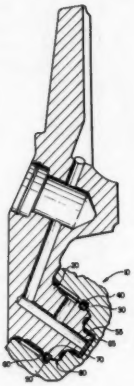
a support spindle having a bearing surface, said support spindle having a tapered leading thrust surface edge wherein said tapered thrust surface edge aids in the mating of the cutter cone with the spindle,

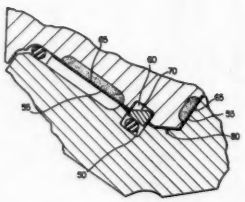
a first annular groove formed in the bearing surface of said support spindle,

a second annular groove formed in the bearing surface of said cutter cone, wherein said first and second annular

grooves are radially adjacent to each other when said cutter cone is secured on to said support spindle,

a holding ring having a plurality of segments forming a ring-like configuration and assembled to partially extend into said first annular groove and to partially extend into said second annular groove to secure said cutter cone into a rotatable position of said support spindle, and





an O-ring of an elastomeric material positioned in said first annular groove between said support spindle and said holding ring for biasing said segments of said holding ring into the ring-like configuration of said first and second annular grooves.

4,880,069

ELECTRONIC BATHROOM SCALE

Richard S. Bradley, Fairmont, Minn., assignor to Weigh-Tronix, Inc., Fairmont, Minn.

Filed Aug. 30, 1988, Ser. No. 238,249

Int. Cl.[4] G01G *3/14, 3/08*

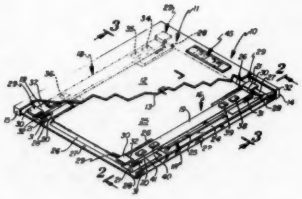
U.S. Cl. 177—211 **6 Claims**

1. A low profile electronic bathroom scale comprising a base plate formed of rigid material,

a generally horizontally disposed load receiving member having upper and lower surfaces and being operable for supporting a person to be weighed,

load sensing means including a pair of elongate substantially straight, laterally spaced apart deformable members, each being rigidly secured adjacent its mid-portion to said base plate, each end portion of each deformable member being spaced from the base and defining a cantilevered beam,

a plurality of similar clip members being of generally Z-shaped configuration and each including a horizontal upper element, a horizontal lower element, and an angularly disposed vertical element interconnecting said horizontal elements, one end of each of said deformable members being positioned upon and rigidly secured to the lower horizontal element of a clip member, the upper horizontal element of each clip member being rigidly secured to said load receiving member whereby a load on the load receiving member will be transferred to the cantilevered beams to cause the latter to deform downwardly,



each end of each deformable member having a plurality of strain gauges secured to the upper surface thereof, and

a Wheatstone bridge circuit including said strain gauges operable to produce an output signal caused by deformation of said deformable members, said strain bridges being connected in said bridge circuit, and means for converting the output signal into a perceptive weight read-out.

4,880,070

TRANSMISSION ASSEMBLY FOR SELF-PROPELLED WORKING VEHICLES

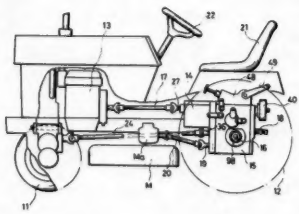
Koji Irikura, Nishinomiya, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Japan

Filed Dec. 13, 1988, Ser. No. 283,629

Claims priority, application Japan, Dec. 29, 1987, 62-332757

Int. Cl.[4] B60K *17/28;* F16H *37/08*

U.S. Cl. 180—53.1 **12 Claims**



1. In a self-propelled working vehicle, wherein axles of left and right rear wheels are supported rotatably by a transmission casing disposed between said left and right rear wheels, said transmission casing including therein a rear-PTO shaft, which extends rearwardly from the transmission casing at a mid level of the casing, and a mid-PTO shaft which extends forwardly from the transmission casing at a low level of the casing, a transmission assembly characterized in:

that there are provided at a front end portion of said transmission casing (15) a first input shaft (28) for transmitting

wheel-driving power into the casing and a second input shaft (27) for transmitting PTO shaft-driving power into the casing, said second input shaft being disposed at a level higher than that of said first input shaft and said first input shaft being located aside in a direction across the transmission casing;

that a speed-change shaft (30) is arranged at a front portion within said transmission casing (15) in a fashion such that said change shaft is located aside in a direction across the transmission casing oppositely from said first input shaft (28) at a level substantially equal to the level of the said input shaft, a change speed gearing (31) being disposed between said first input shaft and said change shaft and a differential gearing (32), drivenly connected to said change shaft, being disposed rearwardly of said change speed gearing, left and right output shafts (33) of said differential gearing being drivingly connected respectively to said left and right rear wheel axles (16) through speed-reduction gearings (34) which are disposed at left and right end portions within said transmission casing; and

that a drive shaft (38), co-axial with and coupled to said second input shaft (27), is arranged within said transmission casing (15) such that said drive shaft extends rearwardly from the casing, a hollow clutch shaft (39) having fore and aft ends located respectively within and outside the transmission casing being mounted rotatably on said drive shaft and being connected drivenly to said drive shaft through a PTO-clutch (40) which is disposed at an outside location of the transmission casing, a first intermediate shaft (41) connected drivenly to said clutch shaft through a speed-reduction gearing (43) being disposed at a rear end portion within the transmission casing and below said clutch shaft, said intermediate shaft having thereon a pair of freely rotatable first and second clutch gears (44, 46) and a PTO-selecting clutch (47) disposed between said pair of first and second clutch gears for coupling said clutch gears selectively to said intermediate shaft, said first clutch gear being connected drivingly to said rear-PTO shaft (18) through a first gear train (44, 91, 92, 93) and said second clutch gear being connected drivingly to said mid-PTO shaft (19) through a second gear train (46, 45, 94).

4,880,071

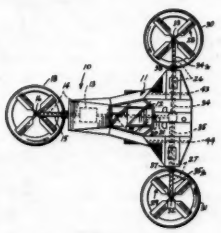
TOY AIR VEHICLE

Stephen E. Tracy, P.O. Box 214, Odin, Ill. 62870

Filed Aug. 10, 1988, Ser. No. 230,516

Int. Cl.[4] B60V *1/00*

U.S. Cl. 180—117 **5 Claims**



1. A vehicle for land and water traverse comprising,

an elongate body housing defining a forward end and a rear portion extending orthogonally of a longitudinal axis of said body housing, and

a first impeller formed with a first surrounding venturi shroud secured forwardly of said forward end, and

a second impeller formed outwardly of one side of said rear portion with a second surrounding venturi shroud secured therearound, and

a third impeller formed outwardly of a second end of said rear portion remote from said first impeller with a third shroud surrounding impeller shroud fixedly secured around said third impeller, and

a motor means positioned in said housing for providing power to said first, second, and third impellers, and

drive shaft means to impart rotational drive from said motor means to said first, second, and third impellers, and

first and second rotational joints positioned adjacent respective of said second and third impellers to enable rotation of said second and third impellers and said second and third shrouds relative to said body housing, and

wherein said rotational joints include first and second flanges fixedly secured to first and second cylindrical housings surrounding a portion of said drive shaft means wherein said first and second flanges includes through extending apertures and removable fasteners for rotating a second flange relative to a first flange to enable rotation of an adjoining impeller and surrounding venturi shroud.

4,880,072

METHOD OF AND APPARATUS FOR CHECKING FOUR-WHEEL STEERING CHARACTERISTICS OF FOUR-WHEEL-STEERED VEHICLE

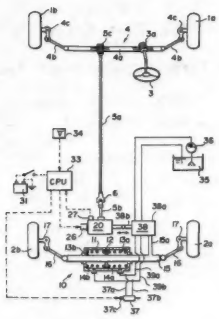
Shunji Sakamoto; Shigeo Okamizu; Yuji Ota, and Hisaaki Katsuki, all of Hiroshima,, Japan, assignors to Mazda Motor Corporation, Japan

Filed Feb. 8, 1988, Ser. No. 153,431

Claims priority, application Japan, Feb. 6, 1987, 62-25792; Feb. 6, 1987, 62-25793; Feb. 6, 1987, 62-25794; Feb. 6, 1987, 62-25795; Feb. 6, 1987, 62-25796; Feb. 6, 1987, 62-25797; Feb. 6, 1987, 62-25798; Feb. 6, 1987, 62-25799; Feb. 6, 1987, 62-25800; Feb. 17, 1987, 62-34002; Feb. 17, 1987, 62-34003; Feb. 17, 1987, 62-34004; Feb. 20, 1987, 62-37357; Feb. 24, 1987, 62-40545; Feb. 5, 1988, 63-25481

Int. Cl.[4] B62D *6/02;* **G01B** *5/255*

U.S. Cl. 180—140 **60 Claims**



1. A method of checking four-wheel steering characteristics of a four-wheeled vehicle provided with a four-wheel steering system in which both the front wheels and the rear wheels are turned in response to operation of the steering wheel according to preset four-wheel steering characteristics, comprising the steps of:

changing the four-wheel steering characteristics according to a factor which can affect running of the vehicle by inputing a simulation signal representing said factor into a controller for determining the rear wheel angle

turning the front wheels, measuring the actual turning angle of at least one of the front wheels and the actual turning angle of at least one of the rear wheels by which the rear wheel is turned in response to the turning of the front wheels and as determined by said controller on the basis of said simulation signal, thereby detecting the actual rela-

tion between the turning angles of the front and rear wheels, and checking whether the actual four-wheel steering characteristics of the vehicle deviate from the preset four-wheel steering characteristics by comparing the actual relation between the turning angles of the front and rear wheels with the preset four-wheel steering characteristics.

41. An apparatus for checking four-wheel steering characteristics of a four-wheeled vehicle provided with a four-wheel steering system having a front wheel turning mechanism for turning the front wheels in response to operation of the steering wheel, a rear wheel turning mechanism for turning the rear wheels, a front wheel turning angle sensor for detecting the front wheel turning angle, a controller which receives a front wheel turning angle signal from the front wheel turning angle sensor and controls the rear wheel turning mechanism to turn the rear wheels in response to operation of the steering wheel according to preset four-wheel steering characteristics, said apparatus comprising

a simulation signal output means which is adapted to input a simulation front wheel turning angle signal representing a front wheel turning angle into the controller of the four-wheel steering system

a rear wheel turning angle measuring means for measuring the turning angle of at least one of the rear wheels by which the rear wheel is actually turned under the control of the controller when said simulation front wheel turning angle is input into the controller, and

a comparator means which detects the actual relation between the turning angles of the front and rear wheels on the basis of the simulation front wheel turning angle signal and data input from the rear wheel turning angle measuring means, and determines whether the actual four-wheel steering characteristics of the vehicle deviates from the preset four-wheel steering characteristics by referring the actual relation between the turning angles of the front and rear wheels to the preset four-wheel steering characteristics.

4,880,073

FOUR-WHEEL STEERING SYSTEM OF A MOTOR VEHICLE

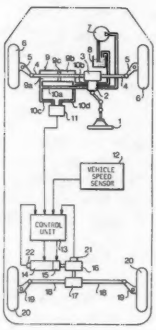
Toshihiro Konno, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,751

Claims priority, application Japan, Dec. 21, 1987, 62-193763[U]

Int. Cl.[4] B62D 5/04, 6/02

U.S. Cl. 180—140 **2 Claims**



1. A steering system for a motor vehicle having a front-wheel steering system including a steering wheel, a hydraulic power cylinder, a piston of which is operatively connected to front wheels, and a control valve responsive to operation of the steering wheel for controlling oil supplied to the power cylinder so as to assist steering effort, the system comprising:

a detector cylinder device having a detector piston with a pair of rods on opposite sides of the piston, a pair of chambers formed on the opposite sides of the detector piston and communicated with chambers on opposite sides of the piston of the power cylinder, and a pair of springs provided in the chambers for urging the detector piston to a neutral position;

a potentiometer operatively connected to one of the rods of the detector piston, for producing an output signal in accordance with displacement of the detector piston; and

rear-wheel steering means responsive to the output signal for steering rear wheels.

4,880,074

STEERING SYSTEM FOR A MOTOR VEHICLE

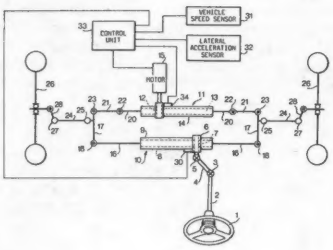
Rempei Matsumoto, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,394

Claims priority, application Japan, May 27, 1987, 62-130643

Int. Cl.[4] B62D 5/04

U.S. Cl. 180—142 **18 Claims**



1. A steering system for a motor vehicle comprising:

a first gear device operatively connected to a steering wheel of the motor vehicle;

a first tie rod operatively connected to the first gear device and arranged to be laterally displaced by the first gear device;

a second gear device;

a second tie rod operatively connected to the second gear device and arranged to be laterally displaced by the second gear device;

actuating means for actuating the second gear device;

at least one sensor for sensing at least one driving condition of the motor vehicle for producing an output signal;

control means responsive to said output signal of the sensor for operating the actuating means;

a pair of connecting rods operatively connecting both ends of the first and second tie rods at each end of the connecting rods, respectively; and

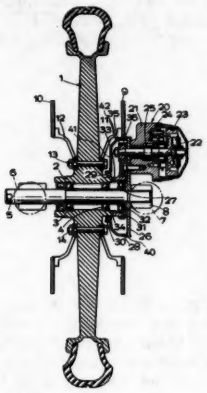
a pair of link mechanisms operatively connected at a side of said connecting rods to front wheels of the motor vehicle so as to combine separate displacements of the first and second tie rods to steer the front wheels at a resultant gearing ratio.

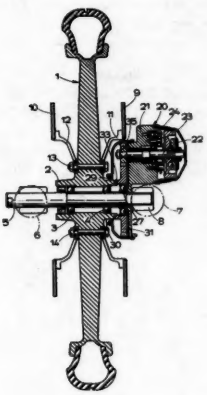
4,880,075

ANTI-LOCK HYDRAULIC MODULATOR UNITS FOR VEHICLES

Robert G. Fuller, Coventry, England, assignor to Lucas Industries Public Limited Company, England

Filed Feb. 16, 1988, Ser. No. 155,893
Int. Cl.[4] B60T 8/34
U.S. Cl. 180—219 9 Claims





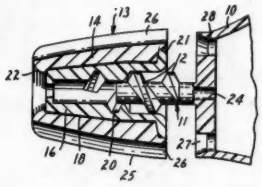
1. In a motor cycle having a non-rotatable axle having opposite ends, a wheel having a hub, an external surface on said hub, means journalling said hub for rotation on said axle, an assembly comprising a brake pressure modulator unit, means for driving said unit from said wheel, a non-rotatable installation plate for installing said assembly on said axle said installation plate having means for mounting said plate on one of said ends of said axle and having an outer peripheral edge, means for mounting said unit on said plate, a non-rotatable casing secured to said assembly, said casing comprising a single imperforate member encircling said axle and enclosing said drive means, said member comprising a first end portion extending axially inwards from said outer peripheral edge of said plate towards said wheel and having an inner end and an outer end, a second end portion extending radially outwards from said external surface of said hub in a direction spaced from and substantially parallel with said plate, said second portion having an inner edge encircling said external surface of said hub and an outer end, and a third connecting portion contiguous with said first portion and said second portion and integral with said inner end of said first portion and said outer end of said second portion, means connecting said outer end of said first portion to said plate, and a sealing means providing a seal between said inner edge of said second portion and said external surface of said hub.

4,880,076

HEARING AID EAR PIECE HAVING DISPOSABLE COMPRESSIBLE POLYMERIC FOAM SLEEVE

Carl S. Ahlberg, Minneapolis; Davis W. Chamberlin; Jerold W. Bushong, both of St. Paul; Robert J. Oliveira, Maplewood, and Vasant V. Kolpe, Mendota Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 5, 1986, Ser. No. 938,540
Int. Cl.[4] A61B 7/02; H04R 25/02
U.S. Cl. 181—130 43 Claims



1. Hearing aid comprising an ear piece including a sound tube, a user-disposable sleeve which is formed with distal and proximal ends, a central longitudinal passage between said distal and proximal ends having a size approximating that of said sound tube wherein the sleeve has an exterior surface, comprises soft polymeric foam that is highly compressible, has slow, substantially complete recovery, and can be compressed to be freely insertable into an external ear canal of the user and to become wedged in the canal when the foam is allowed to recover, and

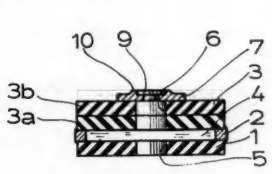
fastening means for disposably attaching the proximal end of the sleeve to said ear piece with said passage connecting the sound tube to the ear canal of the user, said fastening means providing a Holding Value and a Pullout Value and wherein said Holding Value is at least 1½ times said Pullout Value.

4,880,077

BASE FOR A LOUDSPEAKER ENCLOSURE

Gisbert Verse, and Michael Schröder, both of Gelsenkirchen, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 264,457
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 8803128[U]; Apr. 12, 1988, 8804767[U]; May 17, 1988, 8806446[U]
Int. Cl.[4] F16F 15/00
U.S. Cl. 181—207 20 Claims



1. Base for a loudspeaker enclosure, comprising a lower base disk formed of a sound-insulating material, at least one spacing

element attached to said base disk and projecting upward therefrom, and an upper support disk formed of a sound-insulating material that is attached to an opposite side of said spacing element relative to said base disk, wherein an inner hollow space is defined by said disks and by said spacing element, and wherein an area of contact between said disks and said inner spacing element is relatively small in comparison to an area of said disks defining said inner hollow space.

4,880,078

EXHAUST MUFFLER

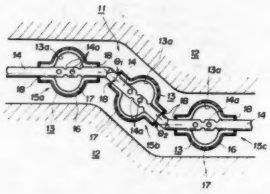
Takeshi Inoue; Hiroshi Funabashi, both of Saitama, and Yukihiro Nakagawa, Aichi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Nakagawa Sangyo Co., Ltd., Aichi, both of, Japan

Filed Jun. 29, 1988, Ser. No. 213,014

Claims priority, application Japan, Jun. 29, 1987, 62-161484; Jun. 29, 1987, 62-161485; Jun. 29, 1987, 62-99865[U]; Apr. 27, 1988, 63-105188

Int. Cl.[4] F01N *1/10, 7/02, 7/14, 7/18*

U.S. Cl. 181—232 **6 Claims**



1. An exhaust muffler having a plurality of component units connected in series with each other by a connector pipe, said connector pipe having at least one inlet end for receiving exhaust gases from an internal combustion engine, and at least one outlet end vented to atmosphere;

each of said component units having a casing defining an internal suppression chamber therein and having an inner layer of a sound-absorbing material which defines said internal suppression chamber, said connector pipe passing through each casing and having upstream and downstream ends projecting out of said casing, the downstream end of the connector pipe of the upstream component of said connector pipe passing through each casing and having eam and downstream ends projecting out of said casing, the nstream end of the connector pipe of the upstream component of said components connected in series being connected to the upstream end of the connector pipe of the following downstream component of said components connected in series, said connected connector pipes holding said casing component units in communication in series with each other;

said connector pipe having at least one opening which opens into said internal suppression chamber in each of said casing component units;

said connector pipe of the most upstream one of said casing component units having an upstream portion serving as said at least one inlet pipe; and

said connector pipe of the most downstream one of said casing component units having a downstream end vented to the atmosphere;

said connector pipes of said component units jointly serving as a single main exhaust pipe; at least one of said component units being constructed to meet:

$$\sqrt{(S/l \cdot V)} < 500\pi/C$$

where V is a volume of said internal suppression chamber, l and S are an effective pipe length of and cross-sectional area of a flow passage in said connector pipe extending from the internal suppression chamber of said at least one of the component units to one of the internal suppression chamber of the next component unit and the end vented to the atmosphere, and C is speed of sound.

4,880,079

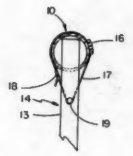
LADDER CAP

Roland P. Leclerc, 735 Ford Dr., Sault Ste. Marie, Mich. 49783

Filed Sep. 1, 1988, Ser. No. 239,227

Int. Cl.[4] E06C *7/48*

U.S. Cl. 182—107 **8 Claims**



1. A ladder attachment disposed to be placed horizontally across the top of the ladder rails, or stiles, to provide a uniform outwardly cylindrical contact member for additional support and stability and protection of the surface against which the ladder is inclined, comprising a unitary cylindrical member of a length greater than the distance between the rails of a ladder; said cylindrical member having two horizontally spaced apertures sufficient to receive and gravitationally retain the uppermost ends of the ladder rails.

4,880,080

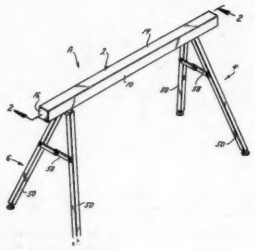
COLLAPSIBLE SAWHORSE

Lester H. Brockman, R.R. 2, Box 279, New Bloomfield, Mo. 65063

Filed Oct. 24, 1988, Ser. No. 261,108

Int. Cl.[4] B27B *21/00;* **B25H** *1/06*

U.S. Cl. 182—155 **15 Claims**



1. A collapsible sawhorse comprising: a channel-shaped beam having parallel side walls which lie along a hollow interior; first and second leg assemblies attached to the beam at opposite ends thereof, each leg assembly including a pivot block which pivots relative to the beam about a first axis that is transverse to the beam and a pair of legs which pivot about a second axis relative to the block between a folded position, wherein they are side-by-side and against each other, and an open position, wherein they are spread apart, the second axis being fixed in position with respect to the first axis and oriented crosswise with respect to the first axis, the legs when in their folded position being capable of fitting into the hollow interior

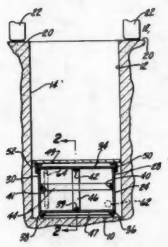
of the beam between the parallel side walls, with the folded legs of the first leg assembly overlying the folded legs of the seconded leg assembly; whereby the sawhorse collapses into a highly compact configuration; and means carried by a leg of the first leg assembly for engaging in a side-wall of the beam and thereby preventing the legs assemblies from pivoting about the first axes and swinging out of the hollow interior of the beam.

4,880,081

OIL TANK CATWALK ASSEMBLY FOR AUTOMOTIVE SERVICE FACILITY

Stephen R. Congleton, 10179 Colonial Industrial Dr., South Lyon, Mich. 48178

Filed Nov. 16, 1988, Ser. No. 271,862
Int. Cl.[4] F16C *3/14*; F16H *33/00*
U.S. Cl. 184—1.5 **21 Claims**



1. In association with a motor vehicle servicing pit structure that includes an elongated bottom wall, two upstanding widely spaced end walls defining the length dimension of the pit structure, and two closely spaced upstanding side walls defining the width dimension of the pit structure, the improvement comprising:

an oil storage tank structure adapted to rest on said pit structure elongated bottom wall; said oil storage tank structure having width and length dimensions less than corresponding dimensions of said pit structure, whereby said oil storage tank structure can be removably installed in said pit structure by lowering said oil storage tank structure into said pit structure; and

a catwalk overlying said oil storage tank structure to provide a walk-on platform for a mechanic who is to service an overhead vehicle.

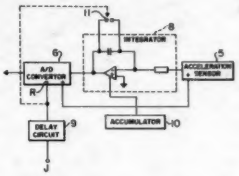
4,880,082

METHOD FOR DETERMINING THE POSITION OF AN ELEVATOR CAR AND A PULSE COUNT BASED FLOOR SELECTOR

Matti Kähkipuro; Heimo Mäkinen, and Jouko Perttula, all of Hyvinkää , Finland, assignors to Kone Elevator GbmH, Switzerland

Filed May 26, 1988, Ser. No. 200,124
Claims priority, application Finland, May 27, 1987, 872369
Int. Cl.[4] B66B *3/02*
U.S. Cl. 187—134 **8 Claims**

1. A method for determining the position of an elevator car by means of a pulse train, whereby the position of an elevator car is determined on the basis of a pulse count proportional to the elevator's speed, wherein the pulses required for calculating the elevator position for floor selection are obtained from an acceleration sensor placed on the elevator car, the output signal of which is integrated so as to obtain a voltage representing the speed of the elevator car, said voltage being converted



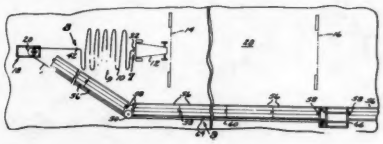
into a pulse train whose frequency is dependent on the speed of the elevator car.

4,880,083

DECELERATION APPARATUS AND METHOD FOR STOPPING A RACING VEHICLE

Marion L. Thompson, deceased, late of San Juan Capistrano, Calif. (by Collene Campbell, executor), assignor to Mickey Thompson Entertainment Group, Anaheim, Calif.

Filed Jul. 7, 1988, Ser. No. 216,108
Int. Cl.[4] B60T *1/12*
U.S. Cl. 188—2 R **24 Claims**



1. Deceleration apparatus for stopping a racing vehicle within a predetermined distance beyond the finish line of a race course, the deceleration apparatus comprising:

tether means having a free extremity for attachment to a racing vehicle located at a race course start line, the free extremity comprising an elongated flexible free payout portion for free payout on vehicle acceleration, the length of the free payout portion approximating the length of the race course; and

energy absorption means adapted for location separately of the racing vehicle and coupled to the extremity of the tether means opposite the free extremity for placing the free payout portion in tension when the racing vehicle reaches the finish line, and operative for decelerating and stopping the vehicle within a predetermined distance.

4,880,084

MECHANICAL LINEAR LOCK WITH REDUNDANT LOCKING FEATURE

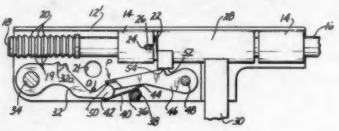
Akira Tanaka, Encino, and Jimmy C.-M. Lee, Simi Valley, both of Calif., assignors to P. L. Porter Company, Woodland Hills, Calif.

Filed Jul. 5, 1988, Ser. No. 214,166
Int. Cl.[4] B65H *59/10*
U.S. Cl. 188—67 **19 Claims**

8. In a fail-safe latch for a linear mechanical lock of the type having a rod axially translatable through a lock housing, a coil spring normally gripping the rod against such axial movement, sleeve means rotatable about said rod for unwinding said coil spring responsive to actuation of lock release means thereby to free the rod for said axial movement, the improvement comprising:

back-up latch means including a toothed pawl pivoted to said housing for movement towards and away from interlocking engagement with a grooved section of said rod;

spring means normally urging said latch means towards said interlocking engagement thereby to hold said rod against said axial movement independently of said coil spring; and



cam means on said rotatable sleeve and cam follower means operative for disengaging said backup latch means from said rod upon rotation of said sleeve to a rod releasing position.

4,880,085

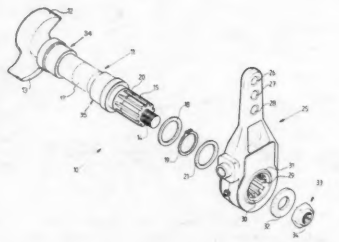
BRAKE CAM SHAFT ATTACHMENT APPARATUS

Gordon J. Taylor, 18 Seng Street, Graceville, Queensland, 4075, Australia

Filed Dec. 21, 1987, Ser. No. 135,324

Int. Cl.[4] F16D *51/00, 65/38;* **B25G** *3/28*

U.S. Cl. 188—79.55 **9 Claims**



1. A brake cam shaft attachment assembly for attaching a brake cam shaft relative to a slack adjuster, the slack adjuster having an opening therethrough with a spline formed therein, said assembly including the cam shaft having cam elements at one end thereof and a threaded attachment portion at the other end thereof, a spline on said shaft adjacent said attachment portion, a circlip locatable about and to the shaft at a location spaced from the one end, said circlip limiting the extent to which the splined end of the shaft projects into the splined aperture of the slack adjuster, a washer locatable about the other end and a threaded fastening means securable to said attachment portion at the other end whereby, when said shaft is secured relative to the slack adjuster, the shaft is locked fast to the slack adjuster to prevent relative longitudinal movement with the latter located on the shaft and between said circlip and said washer with the washer clamped against a side face of the spline of the slack adjuster by said fastening means.

4,880,086

ADJUSTABLE VIBRATION DAMPER

Heinz Knecht, and Norbert Ackermann, both of Eitorf, Fed. Rep. of Germany, assignors to Boge AG, Eitorf, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,979

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719113

Int. Cl.[4] B60G *17/08;* **F16F** *9/50, 15/04*

U.S. Cl. 188—299 **19 Claims**

1. A vibration damper for motor vehicles, said damper comprising a cylinder assembly having an arrangement for varying damping of a piston assembly disposed therein, said piston assembly dividing said cylinder into at least two chambers, each for containing damping fluid, said vibration damper comprising:

means for throttling said damping fluid when said damping fluid moves from one of said chambers into another;

said piston assembly having a piston rod and piston;

said piston rod having first means for attachment of said piston rod at one end thereof;

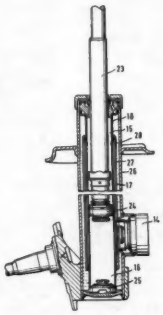
said cylinder assembly having second means for attachment at a portion thereon other than said first means for attachment at said piston rod;

means for bypassing damping fluid between said at least two chambers;

means for accepting bypassed damping fluid;

said bypassing means being disposed to bypass said damping fluid from at least one of said damping fluid-containing chambers to said accepting means;

said bypassing means including damping valve means for regulating flow of said damping fluid in said bypassing means;



said damping valve means comprising:

a principal valve seat and a first displaceable component for opening and closing against said principal valve seat;

said first displaceable component having a first portion for being disposed against said valve seat and a second portion opposite said first portion;

a first, constantly open, bypass orifice being disposed at least in said first portion of said first displaceable component for bypassing pressure buildup at said first portion at least to said second portion of said displaceable component;

a second bypass orifice being disposed in said first displaceable component for bypassing pressure buildup substantially at said second portion to at least a part of said first portion of said first displaceable component; and

a second displaceable component for varying flow through said second bypass orifice, said second displaceable component and said first displaceable component being independently displaceable relative to each other.

4,880,087

TELESCOPIC SHOCK ABSORBER CONSTRUCTION

Geoffrey G. Janes, York, England, assignor to Armstrong Patents Co. Limited, England

Filed Dec. 9, 1987, Ser. No. 130,744

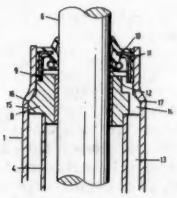
Claims priority, application United Kingdom, Dec. 11, 1986, 8629682

Int. Cl.[4] F16F *9/36*

U.S. Cl. 188—322.16 **6 Claims**

1. A twin-tube shock absorber comprising an outer cylinder, an inner cylinder, a piston rod housed within said inner cylinder, a guide member to locate said piston rod within said inner cylinder and a metal insert seal located inside the top end of said outer cylinder, above said guide member, and slidably embracing said piston rod, wherein said guide member defines

a circumferential ledge, and the upper portion of said outer cylinder is reduced in diameter to define a circumferential shoulder which mates with said circumferential ledge, and a



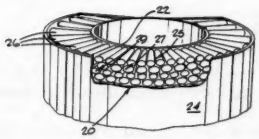
reduced diameter, parallel portion of said outer cylinder above said circumferential shoulder which provides an interference fit between its reduced diameter and the outer diameter of said metal insert seal.

4,880,088

COLLISION PROTECTING SYSTEM FOR TLP STRUCTURES

Joao G. De Oliveira, Stavanger, Norway, assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 7, 1988, Ser. No. 268,394
Int. Cl.[4] F16F *7/12*; B63B *59/02*; E02D *5/60*
U.S. Cl. 188—377 **13 Claims**



1. An energy-dissipation bumper system for protecting a portion of an outer periphery of a column of a tension leg platform, said bumper system comprising

a first inner cylindrical shell;

a second outer cylindrical shell surrounding said first cylindrical shell and being generally coaxial therewith;

a plurality of non-resilient, crushable, thin-walled tubular members lying between said first and said second cylindrical shells, said tubular members being constructed of tubular steel and having a diameter to wall thickness ratio of between about 30 and about 40, said tubular members having a sufficiently large radial extent to permit substantially all of the energy from an impact with said bumper system to be dissipated by absorption due primarily to collapse of said crushable thin-walled tubular members without damage to said first cylindrical shell.

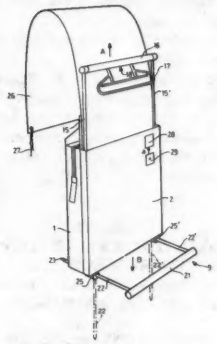
4,880,089

CONVERTIBLE VALET BAG

Dominique Chombert, 82, rue de la Faisanderie, Paris, France, and Francoise Hubert-Sternback, 9 Place Saint Augustin, 75008 Paris, France

Filed Jun. 14, 1988, Ser. No. 206,545
Claims priority, application European Pat. Off., May 20, 1988, 88401237.8
Int. Cl.[4] A45C *7/00, 13/04, 13/24*
U.S. Cl. 190—18 R **9 Claims**

1. A convertible valet bag, characterized in that it is made from a generally rectangular bag opened at the top and fitted, at said top, with holding means, as well as with a frame comprising a generally horizontal base having on opposite ends a first and second, generally vertical, hollow branch and a first and second, generally vertical, hollow guide sleeve, said frame cooperating with a first and second movable body, wherein the first movable body is a suspension body slidably mounted in the generally vertical branches and movable between a resting



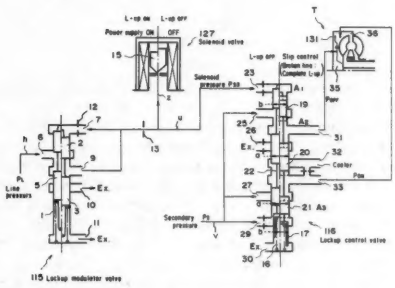
position inside the bag and a working position in which it serves as a support on which to hang articles, and wherein the second movable body is a support body slidably mounted in the generally vertical guide sleeves and movable between a resting position inside the bag and a working position in which it allows the bag to rest in a generally upright position.

4,880,090

HYDRAULIC CONTROLLING SYSTEM FOR LOCKUP CLUTCHES

Masahiko Ando, Anjo, Japan, assignor to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Filed Jun. 11, 1987, Ser. No. 60,697
Int. Cl.[4] F16H *45/02*
U.S. Cl. 192—3.3 **13 Claims**



1. A hydraulic control system for a lockup clutch comprising:

an oil pressure supply source;

regulator means for providing a secondary oil pressure;

a fluid coupling hydraulically transmitting an engine power to an automatic transmission;

a lockup clutch disposed in the fluid coupling, the lockup clutch defining an apply chamber and a release chamber;

a lockup control valve for controlling an amount of engagement of the lockup clutch by a pressure differential between oil pressure in the apply chamber and oil pressure in the release chamber, the lockup control valve having a spool biased by a constant pressure means with first, sec-

ond, third and fourth oil chambers being formed by the spool;

a solenoid valve disposed in an oil path between the first oil chamber and the oil pressure supply source;

the second oil chamber connecting the release chamber to the secondary oil pressure and an exhaust port;

the third oil chamber connecting the apply chamber to the secondary oil pressure;

the fourth oil chamber being connected to the secondary oil pressure; and

each of the second and fourth oil chambers having a pressure-receiving face, the second chamber pressure-receiving face and the fourth chamber pressure-receiving face having identical surface areas and respectively acting in a direction of the constant pressure means and a direction opposite thereto.

4,880,091

CONTROL CIRCUIT FOR FLUID COUPLING WITH LOCK-UP CLUTCH

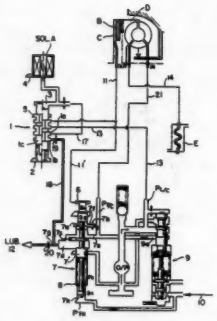
Hiromi Hasegawa, Oobu, and Toshiaki Ishiguro, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1988, Ser. No. 174,811

Claims priority, application Japan, Mar. 31, 1987, 62-76404

Int. Cl.[4] F16H *45/02*; F16D *47/02*

U.S. Cl. 192—3.3 **10 Claims**



1. A control circuit for a fluid coupling with a lock-up clutch, comprising;

a fluid coupling means having a power chamber into which a working fluid is introduced for performing a transfer action between an input element and an output element via the fluid, a clutch member adapted so as to suitably connect and disconnect the input element and output element, a working chamber formed separately of the power chamber, and a piston member displaced by a pressure difference between the working chamber and the power chamber for selectively engaging and disengaging the clutch member;

a fluid pressure source for supplying the working fluid to the power chamber of said fluid coupling;

lock-up clutch control means for selectively supplying and discharging a fluid to and from the working chamber to control the engagement and disengagement of the clutch member;

control means responsive to supply and discharge of the fluid to and from the working chamber by said lock-up clutch control means for lowering pressure inside the power chamber, which is supplied by said fluid pressure source, to a hydraulic pressure depending upon hydraulic pressure from a throttle valve; and

an oil line for supplying a lubricant pressure line with fluid to be supplied to the working chamber, via a port provided in said lock-up clutch control means.

4,880,092

TRANSMISSION OPERATING APPARATUS FOR AUTOMATIC TRANSMISSION

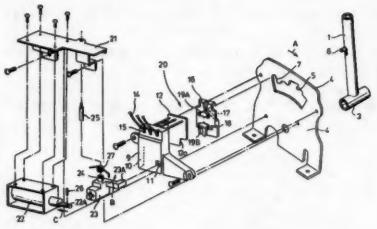
Shozo Kito, Aichi; Shoichi Harada, Gifu; Hajime Imai, Aichi; Hisatoshi Ohta, Aichi; Masamitsu Suzuki, Aichi, and Tadao Muramatsu, Aichi, all of Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Jan. 13, 1989, Ser. No. 296,994

Claims priority, application Japan, Jan. 14, 1988, 63-3951; Jan. 14, 1988, 63-3952

Int. Cl.[4] B60K *20/04*

U.S. Cl. 192—4 A **20 Claims**



1. A transmission operating apparatus for automatic transmissions comprising:

(a) a shift lever to be moved in a shifting direction by a driver when gear shift is intended;

(b) a detent pin secured to said shift lever substantially perpendicularly to the shifting direction of the same and being able to be moved from a first position to a second position by an operation of a pushbutton performed by the driver;

(c) detent means for preventing movement of said shift lever to another shift position by being engaged with said detent pin when said detent pin is positioned at said first position and at a specific shift position of said shift lever, while said detent means permitting a possibility for said shift lever to move to another shift position when said detent pin is positioned at said second position;

(d) a movable body which moves between said first position and said second position together with said detent pin in such a manner that the same is engaged with this detent pin when said shift lever is positioned at said specific position, this movable body being retained at said second position when said shift lever has been moved from said specific position to another shift position, while the same is engaged with said detent pin when said shift lever returns to said specific position;

(e) detection means for detecting whether said detent pin is positioned at said first position or said second position by detecting the movement of said movable body; and

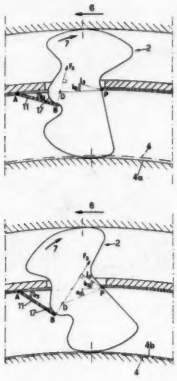
(f) lock means for, when said movable body is positioned at said first position together with said detent pin, preventing movement of said movable body and detent pin to said second position by being engaged with said movable body, this lock means needs to be released by the driver to conduct a shifting operation of said shift lever to the position other than said specific position.

4,880,093

FREE-WHEEL DEVICE HAVING CLAMPING CAMS

Olivier Message, Bourg-la-Reine, France, assignor to SKF France, Clamart, France

Filed Jan. 22, 1988, Ser. No. 146,862
Claims priority, application France, Jan. 29, 1987, 87 01092
Int. Cl.[4] F16D *41/07*
U.S. Cl. 192—45.1 24 Claims



21. A clamping cam element structure adapted to be mounted between a pair of concentric slideways defining therebetween a cylindrical gap, said cam element being adapted to be tilted in one direction into clamping engagement with both of said slideways and in an opposite direction to tend to be disengaged from said slideways, said cam element comprising an external sliding surface and an internal sliding surface capable of coming into sliding or clamping contact with said respective cylindrical slideways depending upon its inclination, a rearface and a front face, said front face having means defining a convex contact zone;

said convex contact zone being adapted for engaging with a pivoting tongue extending from a line of articulation on a strap spring means of generally cylindrical shape mounted between said slideways and having a plurality of windows adapted for mounting therein a plurality of said cam elements, one edge portion of each said windows engaging said rearface of the cam element mounted in the corresponding window for defining a pivoting edge for said cam element, the position and shape of said convex contact zone being such that the lever arm of a force exerted by said pivoting tongue against said convex contact position relative to said pivoting edge varies in inverse proportion to the value of said force when the inclination of the cam element varies due to variations of said cylindrical gap.

4,880,094

CONTROL SYSTEM FOR A CLUTCH FOR A VEHICLE

Hiroya Ohkumo, Koganei, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,347
Claims priority, application Japan, Jan. 23, 1987, 62-13767
Int. Cl.[4] B60K *41/28;* F16D *37/02*
U.S. Cl. 192—0.052 4 Claims

1. In a system for controlling a clutch mounted on a motor vehicle, the clutch selectively transmitting power of an engine to a transmission, the system comprising an engine speed sensor producing an engine speed signal dependent on rotational speed of the engine, a driven member speed sensor producing a driven member speed signal dependent on rotational speed of an output member of the clutch, a select position sensor producing a select position signal dependent on a select position of the transmission, a throttle position sensor producing a throttle position signal dependent on opening degree of a throttle valve of the engine, and a vehicle speed sensor producing a vehicle speed signal responsive to output speed of the transmission, the improvement of the system which comprises,

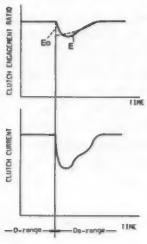
reverse excitation mode deciding means responsive to the engine speed signal and select position signal for producing a reverse excitation signal to supply a small reverse current to the clutch to completely release the clutch,

clutch engagement ration calculating means responsive to the engine speed signal and driven member speed signal for producing an actual engagement ratio signal representative of a lock-up mode, vehicle drive mode and engine drive mode,

clutch current mode deciding means responsive to said actual engagement ratio signal of the clutch engagement ratio calculating means for producing an actual mode signal,

transient mode deciding means responsive to the output signals of the clutch current mode deciding means, driven member speed sensor, select position sensing means, and throttle position sensor, for deciding a transient mode of the clutch,

drive mode deciding means during said transient mode being responsive to a comparative signal representing an engine



speed and said driven member speed signal for producing a drive mode signal,

desired clutch engagement ratio providing means responsive to the drive mode signal for producing a desired engagement ratio signal,

engagement state detecting means for comparing the desired engagement ratio signal with the actual engagement ratio signal for producing a current condition signal,

engagement ratio transition detecting means responsive to the actual engagement ratio signal and a last actual engagement ratio signal dependent on the current condition signal, for detecting an inverse transition of the actual engagement ratio signal, and for producing a correct signal,

slip character decision means responsive to the current condition signal and the correct signal for producing a slip condition signal to correct the clutch current, so as to provide an appropriate slip characteristic of the clutch during an increase or decrease of clutch torque, and

said drive mode signal produced from said drive mode deciding means includes

a vehicle drive mode signal when the engine speed signal is larger than the driven member speed signal, and

an engine drive mode signal when the engine speed signal is smaller than the driven member speed signal.

4,880,095

VISCOUS FLUID COUPLING

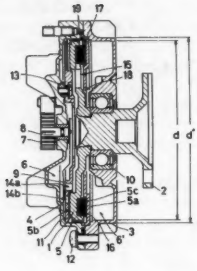
Ryuji Nakamura, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 19, 1988, Ser. No. 145,049

Claims priority, application Japan, Jan. 23, 1987, 62-13859

Int. Cl.[4] F16D *35/00*

U.S. Cl. 192—58 B **8 Claims**



1. A viscous fluid coupling comprising:

a shaft connected to an engine;

a rotor fitted to the shaft, the rotor being rotatable with the shaft;

an output member comprising a case and a cover which constitute the housing of the viscous fluid coupling and in which the rotor is housed, the case and the cover being coupled together;

fluid coupling means for fluidically coupling said rotor and said output member;

bearing means for rotatably mounting said case to said shaft;

a rear plate fitted in the case at the location where the case and cover are coupled together;

a front plate mounted in the cover to define a first reservoir therebetween and having a hole through which oil can flow;

a front fluid chamber formed by the front plate and the rotor;

a rear fluid chamber formed by the rotor and the rear plate, the rotor and the rear plate cooperating to define said fluid coupling means at a radial position near the location where the case and the cover are coupled together, and

a second reservoir formed by the rear plate and the case and being radially positioned such that at least a part thereof is adjacent a radially outside portion of said rear fluid chamber and radially outside said fluid coupling means.

4,880,096

BILL VALIDATOR

Osamu Kobayashi, Tsurugashima; Hiroshi Hayashi, and Ryoji Yamagishi, both of Sakado, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 25,938

Claims priority, application Japan, Mar. 18, 1986, 61-38292; Jul. 14, 1986, 61-10672

Int. Cl.[4] G07D *7/00*

U.S. Cl. 194—206 **7 Claims**

4. A bill validator comprising:

a bill insertion slit;

bill conveying means including a conveying passage communicating with said bill insertion slit and conveying a bill inserted from said bill insertion slit along said conveying passage;

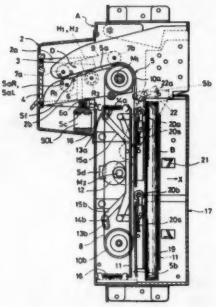
discrimination means for discriminating a true bill from a false one among bills inserted from said bill insertion slit including component elements for discriminating the bill along said conveying passage, said component elements including at least a magnetic sensor which is disposed at the rearmost location of the arrangement of said component elements;

a bill pulling out preventing member provided in a stage prior to said magnetic sensor and projecting into or withdrawing from said conveying passage;

drive means for withdrawing said bill pulling out preventing member from said conveying passage when the bill is inserted and returned;

detecting means for detecting that the rear end of the inserted bill which is being conveyed along said conveying passage has passed by the location of said bill pulling out preventing member;

temporary retention means for temporarily retaining the bill in said conveying passage, at a temporary retention loca-



tion such that at least the first end of the bill has passed the magnetic sensor and the rear end of the bill has not passed the magnetic sensor, by stopping conveying of the bill in response to an output of said detection means;

reverse feeding means for reversely feeding the bill, which has been temporarily retained by said temporary retention means, from said temporary retention location to said bill insertion slit along said conveying passage in response to a bill return command, such that said reverse feeding of said bill is not blocked at said magnetic sensor location;

a bill accumulating box for accumulating accepted bills; and

accumulation means for accumulating the bill which has been temporarily retained by said temporary retention means in said bill accumulating box in response to a bill collection command.

4,880,097

PARK CARD SYSTEM FOR ELECTRONIC PARKING METER

Gary W. Speas, Little Rock, Ark., assignor to POM Incorporated, Russellville, Ark.

Continuation-in-part of Ser. No. 37,252, Apr. 16, 1987, Pat. No. 4,823,928. This application Mar. 25, 1988, Ser. No. 173,719

Int. Cl.[4] G07F *7/08, 17/24*

U.S. Cl. 194—239 **6 Claims**

1. A card system for an electronic parking meter, comprising:

at least one coin;

at least one card having an electrically erasable programmable memory containing data therein;

at least one coin slot in said electronic parking meter, said card having at least a portion thereof dimensioned to fit into said coin slot, said coin slot also capable of receiving said coin when deposited in said coin slot;

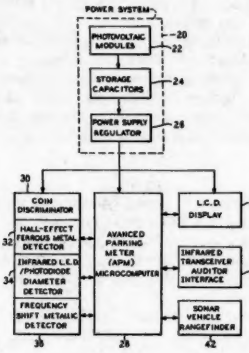
a card switch in said coin slot activated only by said card and providing a card switch signal;

microprocessor in said electronic parking meter receiving said card switch signal and in response thereto, enabling

means for supplying power for said card and exchanging data with said card;

means for interfacing connecting said microprocessor to said card;

said portion of said card having electrical contacts for engagement with electrical contacts of said means for supplying power and said means for interfacing



wherein said system further comprises a door switch located adjacent said coin slot and wherein said coin slot also receives said deposited coin which activates only said door switch to change said microprocessor from a standby mode to an operational mode, said card activating said card switch.

4,880,098

RECEPTACLE HANDLING MACHINE

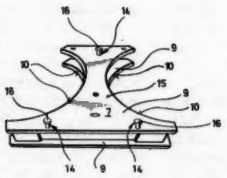
Hermann Kronseder, P.O. Box 1230, 8402 Neutraubling, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 161,172

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 8702940; Aug. 12, 1987, 8710999

Int. Cl.[4] B65G *47/00*

U.S. Cl. 198—346.2 **13 Claims**



1. A receptacle handling machine for the handling of receptacles which are passed through the machine comprising:

a machine frame (13) including a transverse extent, a longitudinal extent, a top side, a center portion, a preset position, and at least one second insertion and stop element (17, 19) having a second transverse stop means, and a second longitudinal stop means set at predetermined distances from said preset position;

at least one receptacle guiding body (7, 8) adapted to be moved in a direction of insertion (E) to said preset position and clamped on said machine frame or unclamped and removed from said machine frame, said guiding body including a bottom side, at least one first insertion and stop element (14) having a first transverse stop means and a first longitudinal stop means set at said predetermined distances when said guiding body is at said preset position;

wherein one of said insertion and stop elements is provided with a substantially U-shaped insertion portion having undercut edges and the other of said insertion and stop elements comprises a bolt having a collar, said bolt having a diameter adapted to fit in the width of said insertion portion of the associated first or second insertion and stop elements and whose collar is larger than said bolt diameter to fit behind the undercut edges of said insertion portion when said guiding body is in an assembled state on said machine frame;

said guiding body (7, 8), when inserted on said frame, having each of said first transverse and longitudinal stop means in contact with said second transverse and longitudinal stop means to precisely position said guiding body in said preset position; and

a releasable clamping member (21) mounted between said guiding body and said machine frame for clamping and holding said guiding body first transverse and longitudinal stop means against both of said machine frame second transverse and longitudinal stop means to prevent transverse and longitudinal play therebetween.

4,880,099

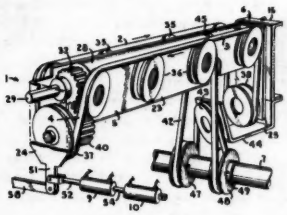
TILTING REVERSIBLE BELT TRANSFER MECHANISM

Hendrik Leemkuil, Pickerington, and Eugene A. Zilber, Columbus, both of Ohio, assignors to Versa Corporation, Mount Sterling, Ohio

Filed Oct. 17, 1988, Ser. No. 259,036

Int. Cl.[4] B65G *47/46*

U.S. Cl. 198—371 **24 Claims**



1. A transfer mechanism comprising:

(a) a cradle frame pivotally supported with respect to an article support to pivot about a cradle frame pivot axis;

(b) an article diverter belt-like member supported on said cradle frame;

(c) transfer drive means engaged with said article diverter belt-like member to drive a transfer portion thereof in a transfer direction substantially parallel to said cradle frame pivot axis; and

(d) cradle frame motive means engaged with said cradle frame and operable to pivot said cradle frame about said axis to engage said transfer portion of said diverter belt-like member with an article on said article support to thereby transfer said article from said article support in said transfer direction.

4,880,100

ADJUSTABLE WORKPIECE ROTATING DEVICE

Mark Tweedy, Mars, and Gary McCoy, Evans City, both of Pa., assignors to Carl Strutz & Company, Inc., Mars, Pa.

Continuation of Ser. No. 932,701, Nov. 19, 1986, abandoned. This application May 9, 1988, Ser. No. 192,000

Int. Cl.[4] B41F *17/20*

U.S. Cl. 198—379 **8 Claims**

1. An adjustable workpiece rotating assembly for rotating a workpiece having at least two opposite ends at a work station positioned along a conveyor system, including:

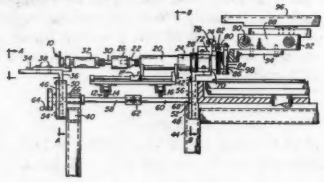
means attached to the conveyor system for positioning the workpiece such that the longitudinal axis thereof extends at a predetermined, desired elevation relative to the work station;

first means for engaging with a first end of a workpiece;

second means for engaging with a second end of a workpiece;

means coupled to at least one of the engaging means for rotating the workpiece about the longitudinal axis thereof after said first and second engaging means, respectively, have engaged with the workpiece;

first support means connected to the first engaging means, said first support means having mounted thereupon a downwardly extending gear rack means;



second support means connected to the second engaging means, said second support means having mounted thereupon a downwardly extending gear rack means;

first spur gear means positioned to allow meshing engagement with the gear rack means of the first support means;

second spur gear means positioned to allow meshing engagement with the gear rack means of the second support means; and

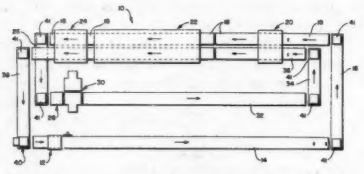
means rotatably supported at a fixed vertical location at the work station for connecting the first and the second spur gear means theretogether such that rotation of the first spur gear means causes a corresponding rotation of the second spur gear means, and to thereby cause vertical translation of the first and second support means, and the first and second engaging means connected thereto, respectively, responsive to such rotation.

4,880,101

PIECE LOCATING SYSTEM FOR PAINTING OR THE LIKE

Richard F. Wiggins, Fairfield, Conn., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 16, 1988, Ser. No. 245,715
Int. Cl.[4] B65G 47/24
U.S. Cl. 198—403 **38 Claims**



1. A method of performing an operation on an object, said method comprising:

a. locating said object on a carrying tray means in a first position with a first orientation and performing a first processing step on said object;

b. locating a first transfer tray means against said object so as to hold said object against said carrying tray means;

c. inverting said carrying tray means and said first transfer tray means so that said object rests on said first transfer tray means;

d. moving said first transfer tray means relative to said carrying tray means;

e. locating a second transfer tray means against said object so as to hold said object against said first transfer tray means;

f. inverting said first and second transfer tray means so that said object rests on said second transfer tray means;

g. moving said second transfer tray means relative to said first transfer tray means;

h. locating said carrying tray means against said object so as to hold said object against said second transfer tray means;

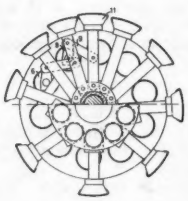
i. inverting said carrying tray means and said second transfer tray means so that said object rests on said carrying tray means in a second inverted position and then performing a second processing step on said object.

4,880,102

DEVICE FOR THE TRANSFER OF ARTICLES FROM A FIRST TO A SECOND CONVEYOR

Leidulf Indrebo, Simlevn. 28, N-3152 Jersoy, Norway

PCT No. PCT/SE88/00019, § 371 Date Nov. 7, 1988, § 102(e) Date Nov. 7, 1988, PCT Pub. No. WO88/05416, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 21, 1988, Ser. No. 254,480
Claims priority, application Sweden, Jan. 23, 1987, 8700279
Int. Cl.[4] B65G 57/00
U.S. Cl. 198—418.3 **4 Claims**



1. A device for transferring articles, preferably absorption bodies (A) intended for diapers or corresponding articles, from a first conveyor (1), on which the articles are advanced with a first given spacing (a) therebetween, to a second conveyor (2), on which the articles are advanced with a second given spacing (b) therebetween, which device (4) includes a plurality of transporting devices (11) which are rotatable about a rotational axis and which during their rotation are intended to collect articles (A) from the first conveyor (1) at a first location (I) along the rotational path of said transporting devices, and to retain said articles until reaching on said path a second location (V) at which the respective articles (A) are deposited onto the second conveyor (2), and which device (4) further includes a mechanism (5–10) by means of which the speed of each article transporting device (11) around said rotational path is varied during each revolution therearound and by means of which there is superimposed on a primary rotational movement of constant speed of the article (A) at least one secondary movement which is co-directional with the primary rotational movement during a given part of said revolution and counter-directional to said primary rotational movement during a further part of said revolution, and in which device (4) each article transporting device (11) is carried by a respective arm (5) whose radially inner end is pivotally mounted to a housing (12) which can be rotated around said rotational axis, and whose radially outer end carries said transporting device (11), characterized in that each of the arms (5) is pivotally journalled between its ends to one end of a respective link (9), and in that the device (4) further includes crank webs (8) each of which is rotationally driven by a respective rotatably journalled drive gear (6) which is in engagement, either directly or

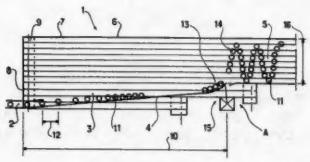
indirectly, with a centrally located gear wheel (10) which is journalled for free rotation relative to the housing (12), and each of which crank webs (8) co-acts with a respective link (9) in a manner to move, during rotation of the housing (12), the other end of respective links in a circular path relative to the rotational axis of the drive gear, so as to cause the arm (5) to oscillate about its pivot point.

4,880,103

PRESSURELESS CONVEYOR FOR BOTTLES OR SIMILAR ITEMS

Marcel Ludwig, La Wantzenau; Robert Schoen, Ostwald, and Othon Elchinger, Roeschwoog, all of France, assignors to Gebo, Reichstett, France

Filed Oct. 2, 1987, Ser. No. 103,706
Claims priority, application France, Oct. 3, 1986, 86 13909
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—434 **5 Claims**



1. A pressureless conveyor for objects comprising a single-channel input conveyor, a slowdown transporter operably connected to said input conveyor, said slowdown transporter being provided with a guide rail, and a juxtaposed multiple-channel output conveyor wherein said guide rail of said slowdown transporter includes a distribution system for transforming straight-line object progression imported by said input conveyor, into a lateral movement combined with progressive movement of said multi-channel output conveyor whereby objects conveyed by said slowdown transporter touch each other before being distributed in a serpentive path over an entire working surface of said output conveyor, said distribution system comprising a curved segment of said guide rail set on said slowdown transporter and a mechanical subsystem for imparting oscillating movement to said curved segment comprising a variable speed motor for rotating a disk about a rotation axis of the disk, a connecting rod having one end rotatably mounted to one of a plurality of fixation points located on said disk concentrically with respect to said rotation axis and another end linked to an extremity of said curved segment whereby frequency and amplitude of a stroke on said curved segment may be varied.

4,880,104

LANE ADJUSTING APPARATUS FOR BOTTLE GUIDES

Neil L. Evans, Fox Lake; Aldo L. Tombolato, DesPlaines; Robert R. Reynolds, Lake Zurich, and Robert J. Meisner, Hinsdale, all of Ill., assignors to Kraft, Inc., Glenview, Ill.

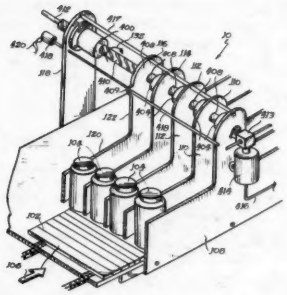
Filed Oct. 5, 1987, Ser. No. 105,100
Int. Cl.[4] B65G *47/12*
U.S. Cl. 198—445 **10 Claims**

1. Apparatus for controlling the transport of rows of moving articles which is adjustable to accommodate articles of different size, comprising

conveyor means for supporting and conveying articles along a moving pathway,

a plurality of lane guides defining product transport lanes along said moving pathway each having at least one support zone having a passageway, and a rotatable shaft positioned in the passageway of each of said lane guides,

a plurality of stationary, internally threaded telescoping elements irrotatably positioned on the respective lane guides, and a plurality of externally threaded telescoping elements respectively rotatably engaged in each of said internally threaded telescoping elements to form respective telescoping assemblies separating adjacent lane guides, wherein said externally threaded telescoping elements are each irrotationally mounted on said rotatable



shaft and are free to slide rectilinearly along the axis of said shaft so that they may be rotationally driven by said shaft,

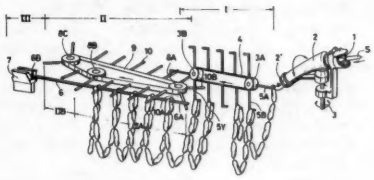
and means for rotating said rotatable shaft such that the distance between each of the lane guides may be simultaneously increased or decreased.

4,880,105

METHOD AND APPARATUS FOR DELIVERING SAUSAGES TO A BAR

Minoru Kasai, Kanagawa, and Minoru Nakamura, Tokyo, both of Japan, assignors to Hitec Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 919,231
Claims priority, application Japan, Oct. 18, 1985, 60-232953
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—465.4 **24 Claims**



1. In a method of producing a string of linked sausages or the like suspended from a bar in loops, a method of delivering the sausages to the bar, the steps comprising:

(a) at an upstream position from a suspending means forming the sausage string into a series of spiral loops having a leading sausage loop,

(b) suspending the series of spiral loops of sausage including its leading sausage loop from said suspending means,

(c) removably fixing axially a bar such that the entire bar extends downstream of the leading sausage loop on the suspending means with the upstream end of the bar facing said leading sausage loop on said suspending means,

(d) delivering the leading sausage loop on the suspending means onto the upstream end of the bar starting from the leading loop so that the bar supports the loop,

(e) while maintaining the sausage loops spaced apart from one another, continuing to deliver successive loops of the sausage string on the suspending means to the upstream end of the bar end while simultaneously sliding the al-

ready-delivered loops along the fixed bar down toward its downstream end, and

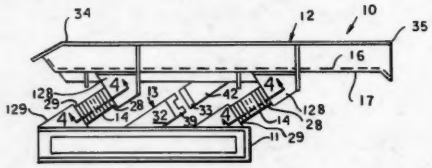
(f) removing the bar with its suspended string of sausage loops thereon.

4,880,106

ELECTROMAGNETIC VIBRATORY FEEDER

Thomas H. Falconer, and William H. Benson, both of Erie, Pa., assignors to Eriez Manufacturing Company, Erie, Pa.

Filed May 19, 1988, Ser. No. 195,862
Int. Cl.[4] B65G 27/08
U.S. Cl. 198—763 **10 Claims**



1. In combination, a feeder comprising a base, a tray, having a bottom with a planar conveying surface,

said bottom having a longitudinal axis, a loading end, and a discharge end,

driver means connected to said base and to said tray,

at least a first spring and a second spring spaced from one another and supporting said tray on said base,

each said spring comprising at least a first elongated flat plate like leaf and a second elongated flat plate like leaf,

each said leaf having two flat planar sides disposed generally parallel to one another and inclined at an acute angle to said conveying surface,

said elongated leaves each having a longitudinal axis extending laterally of said tray longitudinal axis,

first clamping means rigidly clamping said first leaf of each said spring to said second leaf of each said spring,

second clamping means rigidly clamping said first leaf of each said first spring to said bottom of said tray, at a position spaced from said first clamping means,

third clamping means rigidly clamping said second leaf of each said spring to said base, at a position opposite said first clamping means and spaced from said first clamping means and said second clamping means, whereby said first leaf and said second leaf are adapted to act as cantilever springs supporting said tray on said base for vibration by said driver means, thereby conveying articles supported on said tray surface,

said first clamping means being spaced laterally from said second clamping means and said third clamping means.

4,880,107

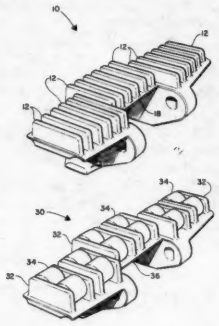
TABLE TOP CHAIN LINK WITH RIB

Douglas O. Deal, Durham, N.C., assignor to Rexnord Corporation, Milwaukee, Wis.

Filed Jul. 31, 1987, Ser. No. 80,753
Int. Cl.[4] B65G 17/00
U.S. Cl. 198—779 **15 Claims**

1. In a link having a greater width than length and used for constructing an endless single-link wide conveyor belt of the type with an upper and lower run and adapted to traverse one or more curves in the pathway along the upper run thereof, which link defines a female portion in the medial portion of the leading edge thereof and a male portion in the medial portion of the trailing edge thereof so that said male portion of a first link may be received in the female portion of a second trailing link and secured together by a pin extending generally parallel to and between the longitudinal axis of each of said links, said pin allowing both relative vertical pivotal movement and relative horizontal pivotal movement between the first and second links;

the improvement wherein said link comprises a plurality of spaced-apart upstanding rib elements on the top surface



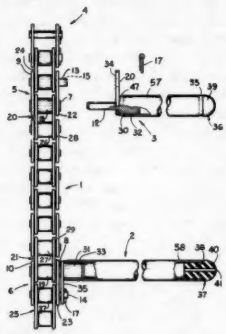
thereof, said rib elements extending a distance no greater than the distance from the front to the back of said link and defining a plurality of spaces therebetween to accommodate the spaced-apart parallel teeth of a conveyor transfer comb.

4,880,108

TUBULAR CARRIER PIN

Robert G. Burk, 821 Main St., Holyoke, Mass. 01040

Continuation of Ser. No. 74,048, Jul. 16, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,067
Int. Cl.[4] B65G 17/42
U.S. Cl. 198—803.12 **10 Claims**



1. A chain assembly comprising:

a plurality of adjacent roller links joined together by a plurality of pin links, each pin link having a first pin plate rigidly attached to first and second pins for insertion through separate adjacent roller links and each pin link having a second pin plate for securing adjacent roller links onto said pins while allowing movement of said roller links in the plane perpendicular to the pins;

wherein some of the pin links have a hollow first pin, wherein said hollow first pin has a larger diameter than said second pin;

a support means inserted in said hollow first pin for supporting objects and carrying objects along a path parallel to chain assembly movement, the support means comprising a tubular carrier pin having a hollow cylindrical body, a

plug pin insertable in one end of the body for insertion into said hollow first pin, a rounded nose at the oposite end of the body; and

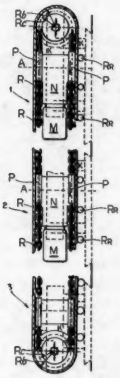
wherein the plug pin has a pintle portion and a body portion, wherein the body portion has a larger diameter than the pintle portion and the body portion is received in one end of the cylindrical body, and a pin plate fixedly connected to the plug pin at the junction of the pintle and body portions for securing the plug pin to the chain assembly.

4,880,109

CHAIN HAULED CONVEYOR BELT

Javier A. Sarasola, Madrid, Spain, assignor to Mackina Westfalia S.A., Madrid, Spain

Filed Nov. 19, 1987, Ser. No. 122,405
Claims priority, application Spain, Nov. 21, 1986, 8603119
Int. Cl.[4] B65G *23/16*
U.S. Cl. 198—833 **7 Claims**



1. A chain-hauled conveyor belt apparatus comprising:

a conveyor belt having an upper run and a lower run;

a frame;

rollers positioned on said frame so that the conveyor belt can rest against said rollers;

a chain connected to said belt;

at least one drive unit, connectable to a motor and having reduction gears, said drive unit having rotatable output shafts that are connectable to said reduction gears, said output shafts extend from the drive unit in opposite directions;

pinion gears connected to said output shafts and arranged with said output shafts to form at least two pairs of adjacent sets of pinion gears, one of said at least two pairs are adjacent to said upper run and another of said at least two pairs are adjacent said lower run and each set is rotatable in the opposite direction from the adjacent set and each said set consists of at least two pinion gears;

a CATERPILLAR TRACK rotatably mounted on each set of pinion gears to contact said chain so that the opposite rotation of said adjacent sets of pinion gears moves said upper and lower run; and

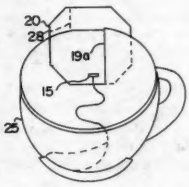
at least one cylindrical returning drum movably attached to said apparatus so that the axial positioning of the drum along the drive unit can be varied by a positioning means, said returning drum has an upper surface that engages the belt and a lower central grove that allows the chain to be slackened as it passes around the returning drum wherein the tension in the belt is determined by the position of the returning drum.

4,880,110

GRASPING MEANS ASSOCIATED WITH RETRIEVAL MEANS FOR INFUSION PACKAGES

Richard S. Walker, 189 Clifton St., Malden, Mass. 02148

Continuation-in-part of Ser. No. 205,167, Jun. 10, 1988. This application Mar. 7, 1989, Ser. No. 320,155
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—0.5 **5 Claims**



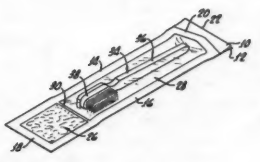
1. An infusion package comprising a bag-like member of porous, non-soluble material adapted to receive and contain material to be infused by external liquid; elongated retrieval means having a first end and a second end, said retrieval means being affixed adjacent said first end to said bag-like member; and tag-like grasping means having a top edge, first and second side edges, and a bottom edge, said grasping means being affixed to said second end of said retrieval means adjacent its bottom edge, and including means for forming a hook-like portion adapted to be secured over the rim of the container in which the infusion process is to take place with the point of affixation of said retrieval means to said grasping means located within the volume defined by said container; said means for forming a hook-like portion comprising a shaped slit having a lower portion extending generally upwardly from an open end located in the bottom edge of said grasping means adjacent the point of affixation of said retrieval means to said grasping means to an upper end, and a upper portion extending transversely across said grasping means above said point of affixation of said retrieval means to said grasping means from said upper end of said lower portion of said slit to a closed end; whereby said hook-like portion may be adjusted to fit over rims of varying thickness to resist dislodgement by bending or tearing caused by forces applied to said grasping means by said retrieval means, and whereby the inadvertent loss o the grasping means into said container may be avoided, both without impediment to the normal operation of the infusion package combination.

4,880,111

SCRUB BRUSH PACKAGE

James T. Bagwell, Anaheim, and Blair E. Howe, Rancho Santa Margarita, both of Calif., assignors to Cimco, Inc., Costa Mesa, Calif.

Filed Sep. 28, 1988, Ser. No. 250,713
Int. Cl.[4] B65D *81/24*
U.S. Cl. 206—209.1 **23 Claims**



1. A method of applying a material to an object having an elongated handle, and thereafter causing said object to trans-

port said material and apply said material to a region of use, said method comprising the steps of:

juxtaposing first and second thin, flexible, unmolded plastic packaging sheets to one another,

sealing said sheets to one another along their peripheries to form a package having a packaging compartment and having an opening,

inserting an object having an elongated handle into said compartment, in such manner that an end of said object remote from said handle thereof is disposed at an intermediate portion of said compartment, said object incorporating, at a region adjacent said end thereof, a combination material-transporting and material-application means that is distinctly different from said handle, said end of said object not being sharp.

forming a barrier seal between said sheets, by pressing said sheets together, adjacent said object end to divide said compartment into a first chamber and a second chamber, said first chamber containing said object and said handle thereof.

inserting into said second chamber a material to be applied to said combination material-transporting and material-application means,

sealing said opening,

manipulating said object and handle in said package to cause said end to force said sheets apart at said barrier seal and thus rupture said barrier seal and enter said second chamber, said manipulating step being such that said end and at least part of said combination material-transporting and material-application means pass through said ruptured barrier seal and at least partially enter said second chamber.

applying a desired amount of said material to said material-transporting and material-application means while said material and at least part of said combination material-transporting and material-application means are within said second chamber,

completely removing said object from said package, in such manner that said end and said combination material-transporting and material-application means pass through said ruptured barrier seal, in a relative direction that is the reverse of that which was followed during said rupturing, said

thereafter transporting said material-bearing object to a point of application and applying said material to a desired region of use.

4,880,112

PET FOOD CONTAINER

George R. Conrad, Dunwoody, Ga., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 4, 1988, Ser. No. 228,073

Int. Cl.[4] B65D *1/34, 25/20, 85/72*

U.S. Cl. 206—216 7 Claims

1. A container for food, such as pet food and the like, comprising: a tray having a side wall and an integrally formed bottom surface for providing a receptacle for pet food, an open end opposite said bottom surface defined by said side wall, a cover detachably secured to said side wall at the open end so as to confine food within the tray, adhesive means located on said bottom for securing the tray to a surface, means detachably covering said adhesive means, and wherein upon removal of the cover access to the food is provided with said adhesive means allowing securing the tray to a surface.

4,880,113

TROLLEY WITH HANGER RETAINING STRUCTURE WHICH INHIBITS UNINTENDED HANGER WITHDRAWAL

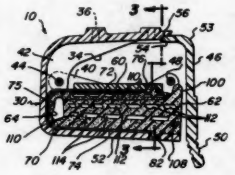
Lawrence R. Mobley, Aurora, Colo., assignor to Samsonite Corporation, Denver, Colo.

Continuation of Ser. No. 917,409, Oct. 10, 1986, Pat. No. 4,798,289, which is a continuation-in-part of Ser. No. 754,617, Jul. 12, 1985, Pat. No. 4,640,414, which is a continuation-in-part of Ser. No. 673,353, Nov. 23, 1984, Pat. No. 4,618,058. This application Aug. 5, 1988, Ser. No. 229,018

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[4] B65D *85/18*

U.S. Cl. 206—287 4 Claims



1. In a trolley for suspending and retaining the hooked ends of clothes hangers in a luggage piece, comprising a substantially rigid frame member which defines an opening extending into the frame member from a front location thereof, a gripping structure, said gripping structure being formed of resilient and flexible material and having an edge extending therealong which contacts the hanger ends, means for operatively connecting the gripping structure to the frame member within the opening in an opposing facing relationship and between which the hooked ends of hangers are inserted and removed from the front location, and an improvement in combination therewith comprising:

means structurally integral with and interior of the edge of the gripping structure for creating a resistance to the removal of the hanger ends from the gripping structure, which resistance is created from the resiliency of the gripping structure and is greater upon movement of the hanger ends toward the front location than upon movement of the hanger ends rearwardly away from the front location.

4,880,114

PACKAGE

Heinrich Korte, Grosswolder Strasse 60, D-2957 Westoverledingen 1, Fed. Rep. of Germany

Filed Jul. 6, 1988, Ser. No. 215,687

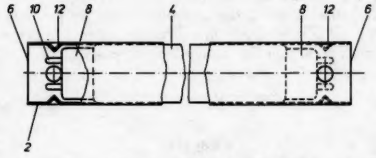
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 8709437[U]

Int. Cl.[4] B65D *85/42*

U.S. Cl. 206—418 20 Claims

1. A package for an item such as a fluorescent tube and the like and comprising an elongated open ended body portion having a cross sectional configuration for suitably receiving an item therewithin, said body portion including at least a pair of opposed naps adjacent each open end thereof for retaining an item within said body portion, said naps being spaced inwardly from the open end of said body portion to which they are adjacent and extending inwardly of said body portion to protrude therewithin beyond the outer dimension of the item to be received therewithin, said naps adjacent one end of said body

portion being spaced apart from said naps adjacent the other end of said body portion in juxtarelation to respectively pro-



trude inwardly of said body portion adjacent an outer end of the item received therewithin.

4,880,115

MULTIPACK FOR CANS INCORPORATING PLASTICS SECURING BAND

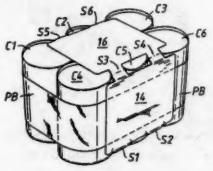
Jean Chaussadas, Deols, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 11, 1988, Ser. No. 217,181

Claims priority, application United Kingdom, Jul. 10, 1987, 8716355; Jul. 2, 1988, 8815582

Int. Cl.[4] B65D *65/00, 75/00*

U.S. Cl. 206—427 **7 Claims**



1. A composite package for a group of containers such as cans having cylindrical side walls and substantially flat top- and bottom ends, said containers being arranged in at least two parallel rows so that the containers are longitudinally and transversely aligned in a generally rectangular formation, the package comprising a band of elastic plastic material encircling the periphery of said group intermediate the top and bottom ends of said containers and being placed under tension when applied, and a stabilizing means for maintaining said group in its generally rectangular formation comprising a paperboard wrapper extending around said group in a direction perpendicular to said band and comprising a top panel, side walls and base panel means joined together along fold lines, characterized in that said wrapper provides spacer elements disposed between adjacent containers in each of said rows and effective to maintain said containers in aligned relationship with each other whereby said band is maintained under tension.

4,880,116

ROBOTIC ACCESSIBLE WAFER SHIPPER ASSEMBLY

Robert D. Kos, Victoria, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 163,981, Mar. 4, 1988. This application May 20, 1988, Ser. No. 196,734

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] B65D *85/48*

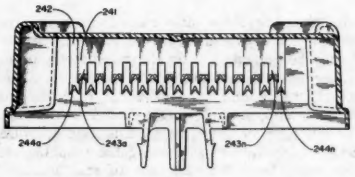
U.S. Cl. 206—454 **13 Claims**

1. A wafer shipper assembly comprising:

(a) a shipper base including a generally rectangular floor member having walls angled upwardly and slightly outwardly from the floor to a generally rectangular shaped rim, interior vertical corner indentations, an interior vertical bar indentation in an end wall, exterior recesses generally conforming to the corner indentations and the bar indentation extending from the floor to about the mid-height of the base, the walls generally conforming to the shape of the rim from the rim to about the mid-height of the base, thereby forming exteriorly accessible ledges at each corner of the base at about the mid-height of the base and one part of a two part latching arrangement on each of two opposite walls;

(b) a generally rectangular carrier including an exteriorly projecting bay shaped rear face and an open letter-H configured front face securing outer edges of mirror-image side faces, interiorly extending wafer supporting spacers in the side faces for supporting a plurality of wafers in upright parallel spaced apart axial alignment, vertical wings angled outwardly from outer edges of the front and rear faces extending up from about the mid-height of the carrier, registration bars on outer edges of the front face extending down from about the mid-height of the carrier; and

(c) a shipper cover including a generally rectangular top



member having a plurality of wafer engaging and supporting members in cooperating alignment with the wafer supporting spacers in the carrier, four walls angled downwardly and slightly outwardly from the top member and a second part of a two part latching arrangement on each of two on opposite walls in cooperating alignment with said one part of a two part latching arrangement on the shipper base;

so that the wafer carrier is received within the shipper base with registration bars cooperating with the bar end indentation to insure one-way alignment of the wafer carrier within the shipper base, and the shipper cover is received by the shipper base containing the wafer carrier with the wafer supporting members in the cover cooperating with the wafer supporting spacers in the carrier to provide upright parallel spaced apart axial alignment of wafers, and with one part of a two part latching arrangement on the cover cooperating with a second part of a two part latching arrangement on the shipper base to provide latching engagement of the shipper cover with the shipper base containing the wafer carrier, thus providing a secure package for transportation and storage of wafers.

4,880,117

DISPLAY CARD ASSEMBLY FOR RING-LIKE ORNAMENTAL ARTICLES

Richard S. Garganese, 40 Celestia Ct., North Kingstown, R.I. 02852

Filed Aug. 22, 1988, Ser. No. 234,956

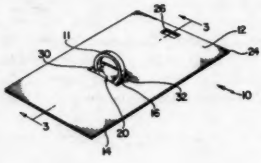
Int. Cl.[4] B65D *73/00*

U.S. Cl. 206—487 **9 Claims**

1. A display card assembly for displaying a ring-like ornamental article comprising first and second substantially flat cards having first and second apertures therein, respectively, and a substantially flat retaining card, said retaining card having a pair of spaced substantially parallel slits therein which extend inwardly from an edge thereof, said slits defining the side edges of an elongated retaining member in said retaining card, said elongated retaining member being dimensioned for receiving said ornamental article thereon, said first card being secured to said second card so that said first and second aper-

tures are in at least partially aligned relation, said retaining card being received and secured between said first and second cards so that said elongated retaining member passes across the opening defined by the aligned portions of said apertures with the opposite side edges of said elongated retaining member spaced inwardly from the perimeter of said opening, said ornamental article being received on the portion of said retaining member passing across said opening.

5. A display card assembly for displaying a ring-like ornamental article comprising a substantially flat display card having an aperture therein, and a substantially flat retaining card,



said retaining card having a pair of spaced substantially parallel slits therein which extend inwardly from an edge thereof, said slits defining the side edges of an elongated retaining member in said retaining card, said elongated retaining member being dimensioned for receiving said ornamental article thereon, said retaining card being secured to said display card so that said elongated retaining member passes across said aperture with the opposite side edges of said elongated retaining member spaced inwardly from the perimeter of said aperture, said ornamental article being received on the portion of said retaining member passing across said aperture.

4,880,118

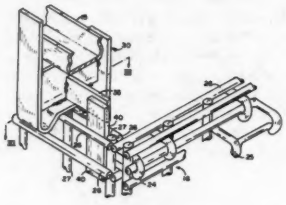
STABILIZER FOR STACKABLE AND FOLDABLE WIRE CONTAINERS

Jay C. Petter, Pentwater, Mich., assignor to Pentwater Wire Products, Inc., Pentwater, Mich.

Filed Jan. 30, 1989, Ser. No. 303,138

Int. Cl.[4] B65D *21/02, 6/08*

U.S. Cl. 206—513 **2 Claims**



1. A rectangular shipping container having vertical panels fabricated of rods welded to form a mesh and a bottom panel, said container having a depending support member spaced a short distance from each of its corners, said members being rigidly secured to said container, each of said support members having an upwardly recessed lower surface forming a pocket to seat over and receive the top edge of a like container beneath it, the improvement in said container comprising: a pair of upstanding stops rigidly secured to each of a pair of opposite sides of said container, one at each end of each of said sides; each stop being located in vertical alignment with the space between the end of the panel and the support member depending therefrom of a like container seated said container whereby it will extend upwardly between the support member and the adjacent end of said like container stacked thereon to prevent movement of the container above lengthwise of the sides to which the stops are secured; a second stop rigidly secured to the support members adjacent each of the corners of the container above and extending toward the adjacent corner of the container a distance such that each will overlap the upwardly projecting first stops of the container below to prevent displacement of said container in a direction normal to the plane of the sides on which the container is supported.

4,880,119

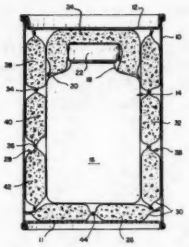
CUSHIONED CONTAINER FOR HAZARDOUS MATERIAL

B. Kenneth Simon, 40 Woodhaven Dr., Pittsburgh, Pa. 15228

Continuation of Ser. No. 34,547, Apr. 6, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 210,865

Int. Cl.[4] B65D *81/14, 85/84*

U.S. Cl. 206—584 **11 Claims**



1. In combination, a metal container, a bottle for containing a hazardous material disposed within said container, said bottle having a body and a closure cap, a plurality of separate, unattached, removable and repeatably moldable and shapable cushion elements adaptable to conform with bottle surfaces and to accommodate a variety of sizes of bottles and containers, said cushion elements disposed between said bottle and said container, said cushion elements being filled with free flowing particulate solid absorbent material, said cushion elements containing sufficient absorbent material to absorb essentially all of the hazardous material in the bottle, said cushion elements arranged to fit snugly between the bottle and the metal container with said cushion elements filling essentially the entire space between the bottle and the metal container to tightly secure the bottle in a non-movable position.

4,880,120

PLASTIC CONTAINER INSPECTION PROCESS

Michael J. Myers, Lawrenceville, Ga., and Warren J. Harwick, Milwaukee, Wis., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 92,003, Sep. 2, 1987. This application Aug. 8, 1988, Ser. No. 229,839

Int. Cl.[4] B07C *5/02, 5/34;* G01N *33/00*

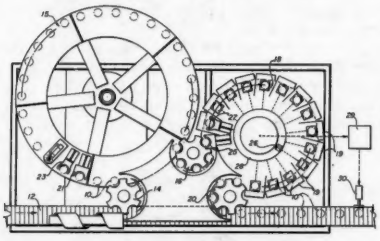
U.S. Cl. 209—3.1 **13 Claims**

1. A process for detecting volatile contaminant components of organic contaminants which are present on or absorbed into the walls of plastic containers having a beverage residue including volatile beverage components comprising:

(a) injecting a substantially inert gas into said containers to remove the volatile beverage components and volatile contaminant components,

(b) drawing a vapor sample after the release of additional volatile contaminant components by the organic contami-

nant but before any substantial release of volatile beverage components by the beverage residue, and



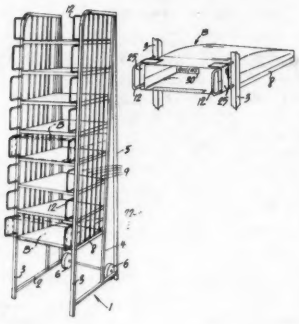
(c) analyzing said sample by ionization means to detect the presence of the volatile contaminat components in said container.

4,880,121

METHOD AND APPARATUS FOR THE SORTING OF MATERIAL

Ronald J. D'Elia, Greenwich, Conn., assignor to Delco Associates, Inc., Greenwich, Conn.

Filed Mar. 30, 1988, Ser. No. 175,166
Int. Cl.[4] B07C 7/04
U.S. Cl. 209—702 **16 Claims**



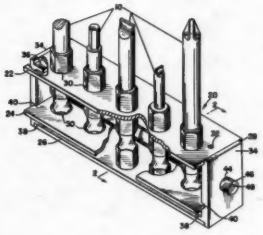
1. A mail sorting system comprising a rigid rack including two vertical support and a plurality of horizontally extending elements arranged in vertically spaced arrangement, and a plurality of bag members removably supported on said horizontally extending elements for receiving material therein, each bag member including a mouth portion, projecting elements on said rack spaced one above the other for engaging respective bag members to hold the same with their mouth portions open, said projecting elements projecting forwardly from each vertical support in vertically spaced relation such that the projecting elements on the two vertical supports are arranged in horizontal pairs for each engaging a respective bag member, so that the mouth portions of the individual bag members are stretched open and face forwardly one mouth portion above the other on said rack, said horizontally extending elements and said projecting elements maintaining said bag members substantially horizontally one above the other with their mouth portion open.

4,880,122

STORAGE AND DISPLAY APPARATUS FOR POWER BITS

J. Richard Martindell, 9605 Village Green N.E., Albuquerque, N. Mex. 87111

Filed Sep. 23, 1988, Ser. No. 248,536
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—70.6 **8 Claims**



1. An apparatus for discretionarily securing and releasing tools having non-circular shanks and having a groove extending circumferentially about the shank with a flat center portion and a radiused portion on the groove comprising in combination:

a rack means including

an elongated upper shelf with holes aligned in the longitudinal direction,

an elongated middle shelf with an identical row of holes so disposed as to be in axial alignment with the holes in the upper shelf,

an elongated lower shelf parallel to the upper and middle shelves, the surface of which is uninterrupted,

rack ends parallel to each other and perpendicular to the shelves in the longitudinal direction, with a hole in each in axial alignment, one to the other, the axis of which is perpendicular to the rack ends, and

a rod means having a D shape in cross section and a diameter approximately twice the radius of the tool shank groove, disposed in the rack end holes such that rotation of the rod is permitted about their co-axes,

the structural and functional relationship between the rack means, the rod means assembled therein and the tools is such that the holes in the upper and middle shelves are of a size to accept the tools shanks, holding the tools perpendicular to the shelves, the axial movement of the tools is restrained against further axial movement in the insertion direction by the lower shelf, and in a fixed relationship to the upper and lower shelves, the middle shelf being located to engage the non-circular shank below the groove of the tool when the tool bears against the lower shelf and the upper shelf being located above the groove, the axial location of the rod means, and the rack end holes, relative to the axis of the tool retaining holes in the upper and middle shelves and the tool arresting lower shelf is approximately coaxial with the axis of the lower tool shank radius, with the tool in the arrested position, the chord length of the flat surface of the rod means being such as to allow clearance with the outermost circumferential extremities of the non-circular tool shank when the flat surface of the rod means is rotated to a position parallel to the axis of the tool retaining holes in the upper and middle shelves of the rack means permitting removal and insertion of the tool shank and conversely prohibiting extraction or insertion of the tool shank when the rod means is rotated such that the flat surface of the rod means is at an angle to the tool axis and its circumferential surface is in a position

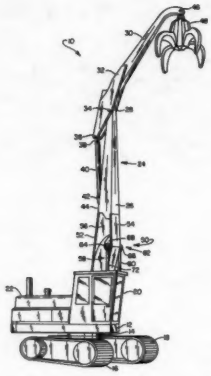
to coincide with the radius portion of the groove in the tool bit shank.

4,880,123

METHOD FOR CONVERTING A DIGGING BOOM TO A LIFTING BOOM

Harold G. Norris, Jr., 7274 Roswell Rd., Sherrodsville, Ohio 44675

Filed May 11, 1988, Ser. No. 192,857
Int. Cl.[4] B23K *31/02*
U.S. Cl. 212—177 **10 Claims**



1. A method for converting an angulate form boom component into a lifting boom, said angulate form boom having an angulate transition region with oppositely disposed sides extending between top and bottom sides and having a lift bearing position at said sides located proximate the angulate transition region of said boom component, the method comprising the steps of:

cutting said boom into first and second separate parts along a parting locus extending within said angulate transition region from a first predetermined position at said bottom through said sides, passing adjacent said lift bearing position t a second predetermined position at said top;

separating said first and second parts a select, spaced-apart distance;

aligning the top side of said first part with the top side of said second part substantially t a co-planar relationship minimizing said angulate transition;

providing a top insert extending from a third predetermined position at said first part top side substantially to said second predetermined position;

providing a bottom insert extending from said first predetermined position at said first part bottom side to a fourth predetermined position at said second part bottom side;

providing side inserts having configurations conforming with the openings defined between said bottom and top inserts;

securing said top, bottom and side inserts with said first and second parts to form a lifting boom.

4,880,124

STRADDLE CRANE STEERING SYSTEM

Thomas Feider; Gerald P. Lamer, and Norbert W. Lenius, all of Sturgeon Bay, Wis., assignors to Marine Travelift, Inc., Sturgeon Bay, Wis.

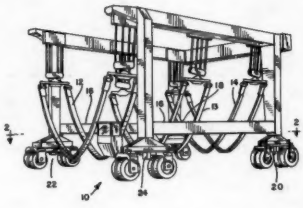
Filed Apr. 22, 1988, Ser. No. 185,192
Int. Cl.[4] B66C *5/02*
U.S. Cl. 212—218 **4 Claims**

1. In a straddle-type crane having a frame and four corners, a system for the manual resynchronization or automatic synchronous movement of a plurality of pairs of steerable wheels, said pairs of steerable wheels being pivotal relative to said frame, said system comprising:

(a) a hydraulically-actuated link and tie rod at each corner of said frame to turn all pairs of steerable wheels at each corner of said frame;

(b) a hydraulic cylinder for each of said hydraulically actuated links and tie rods, said hydraulic cylinders being connected to each other in series relationship;

(c) a steering orbitrol which directs hydraulic fluid through said series-connected hydraulic cylinders;



(d) a normally open solenoid valve adjacent to and permitting the flow of hydraulic fluid into each of said hydraulic cylinders;

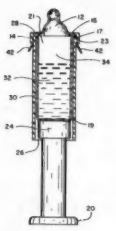
and (e) a control for selectively closing the solenoid valves adjacent to three of four of said hydraulic cylinders, thereby preventing the flow of hydraulic fluid into said three of four hydraulic cylinders, whereby said orbitrol directs hydraulic fluid through said remaining open solenoid valve and the fourth of said hydraulic cylinders, to thereby effect turning of only the wheels controlled by said fourth hydraulic cylinder.

4,880,125

ANTI-BURP NURSING BOTTLE COMBINATION

Phil E. LeBeau, Rte. 5, Dexter, Mo. 63841

Filed Apr. 21, 1988, Ser. No. 184,429
Int. Cl.[4] A61J *9/00*
U.S. Cl. 215—11.3 **4 Claims**



1. An anti-burp nursing bottle combination comprising an open ended bottle shell adapted to retain a disposable collapsible liquid container held in place by a ring encircling the top of said shell, said ring retaining a nipple in place on top of said shell in sealing relationship with said liquid container, said open ended bottle shell being adapted to accept a plunger in the open lower end of said bottle shell in mating relationship therewith, said plunger having a base adapted to retain said combination in an upright position, a crown adapted to fit snugly inside said open lower end of said bottle shell about two inches in diameter and from about one half inch to about one and one half inches thick comprised entirely of a foamed plastic composition, and a trunk located between and connecting said crown and said base having a diameter only slightly less

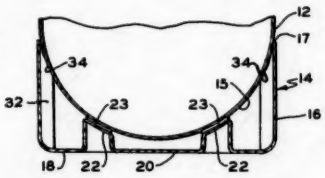
than the diameter of said crown to provide support therefor, said plunger adapted to be moved upwardly inside said open ended bottle shell against the lower portion of said liquid container to force air trapped within said collapsible disposable liquid container out through the nipple on top of said open ended disposable bottle shell to remove substantially all entrapped air inside said collapsible disposable liquid container prior to use by an infant.

4,880,126

NESTING PREVENTER FOR BOTTLE BASES

Dennis C. Anderson, 6475 Chester Ave., Northfield, Minn. 55057

Filed Mar. 15, 1988, Ser. No. 168,244
Int. Cl.[4] B65D *23/00, 23/08*
U.S. Cl. 215—100 R **5 Claims**



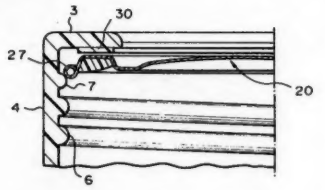
1. A bottle base for a soda pop bottle or the like comprising,
a base formed from plastic resinous material having a cylindrical side wall terminating in an upper open wide mouth defining a rim and an integral bottom wall extending horizontally across the lower aspect of the base,
mounting means within the base for the attachment of a bottom portion of the bottle to the inside of the base and
a plurality of internally projecting stacking preventers extending substantially the full height of the base, terminating at the rim, said stacking preventers projecting centrally from the side wall and being spaced apart from one another in a circle which has the same diameter as the cylindrical side wall and each of said stacking preventers including a downwardly inclined centrally directed upper free edge intersecting with said side wall at an acute angle that comes to a point proximate to the open mouth to define a ramp surface which extends downwardly from the mouth and centrally to engage the bottom of a similar base to prevent it from entering the mouth a sufficient distance to become stacked or nested within the base.

4,880,127

COMPOSITE VESSEL LID

Kouichi Doi, Hiratsuka, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,405
Claims priority, application Japan, Mar. 4, 1988, 63-49567
Int. Cl.[4] B65D *51/16*
U.S. Cl. 215—252 **5 Claims**



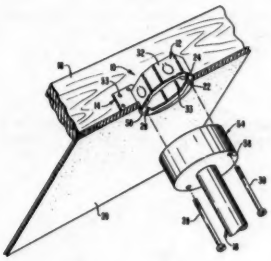
1. A composite vessel lid comprising an outer lid of a plastic material including an annular top panel wall having an opening in the central portion, a cylindrical skirt hanging down from the peripheral edge of the top panel wall, holding projections formed on the inner circumferential surface of the skirt and a screwed portion formed in the lower portion of the outer lid and adapted to engage with a neck of a vessel, and an inner lid of a thin metal sheet held on the inner side of the outer lid by said holding injections, wherein on the inner side of the top panel wall, fine projections are formed at predetermined intervals at least in a portion to be fitted with the inner lid at the time of sealing of the vessel lid.

4,880,128

FIXTURE BOX FOR CEILING FAN SUPPORT

Robert W. Jorgensen, Niles, Mich., assignor to Hubbell Incorporated, Orange, Conn.

Filed Dec. 16, 1988, Ser. No. 285,819
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.9 **20 Claims**



1. A fixture box adapted to mount and support a fixture, the combination comprising:
a top portion;
a side portion having an inner surface and a top edge, said top edge being coupled to said top portion and said side portion extending substantially perpendicular to said top portion; and
a continuous flange coupled to said side portion along the entire periphery of said inner surface of said side portion and projecting inwardly substantially perpendicular to said side portion, said continuous flange having a pair of mounting holes extending therethrough, said pair of mounting holes being adapted to receive a mounting means coupled to the fixture, whereby the fixture is mounted to said continuous flange.

4,880,129

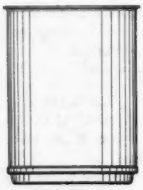
METHOD OF OBTAINING ACCEPTABLE CONFIGURATION OF A PLASTIC CONTAINER AFTER THERMAL FOOD STERILIZATION PROCESS

Robert J. McHenry, St. Charles; Joseph B. Brito, Wildwood; Wilson T. Platt, Jr., Sugar Grove, all of Ill.; Robert J. Reed, Jackson, Miss.; Krishnaraju Varadarajan, Hoffman Estates, Ill.; Kenneth B. Spencer, Barrington, Ill.; Boh C. Tsai, Rolling Meadows, Ill.; Mark A. Williams, Schaumburg, Ill.; Donald C. Vosti, Crystal Lake, Ill., and James A. Wachtel, Buffalo Grove, Ill., assignors to American National Can Company, Greenwich, Conn.

Continuation of Ser. No. 627,703, Jul. 3, 1984, Pat. No. 4,667,454, which is a continuation-in-part of Ser. No. 455,865, Jan. 5, 1983, Pat. No. 4,642,968. This application Mar. 9, 1987, Ser. No. 23,419
Int. Cl.[4] B65D *1/16*
U.S. Cl. 220—70 **20 Claims**

1. A high oxygen barrier thermally sterilizable plastic container for packaging food comprised of a high oxygen barrier layer and one or more structural layer(s) which consist(s)

essentially of polyolefin(s), which container has been annealed and shrunk at about 250% F. for about 15 minutes or the equivalent, said container thereby having enhanced thermal sterilization characteristics in that, by virtue of its residual



shrinkage when the container is filled with food, sealed and thermally sterilized at from about 190° F. to about 270° F. for a few minutes to about several hours, it will shrink about 2% or less during the thermal sterilization.

4,880,130

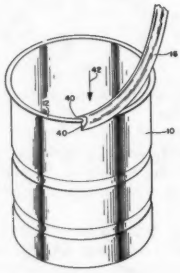
FLEXIBLE, EXTRUDED, PROTECTIVE RIM

Peter J. Blake, P.O. Box 982, Bondsville, Mass. 01009

Filed Jul. 21, 1988, Ser. No. 222,570

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—85 K **15 Claims**



1. A protective device for the rims of containers that present dangerous or jagged edges to a handler, said device comprising a flexible length of relatively soft material of uniform section,

said length of material having a relatively smooth upper surface and outer side surfaces, and a downwardly open upwardly extending slot at its lower surface for reception of the dangerous (rim) edge of the container, said slot having outer edges,

and interior recesses extending laterally from the slot, the outer edges of the slot being closer together than the lateral extent of the (two) recesses, and the recesses being larger than the dangerous edge.

4,880,131

RINGLESS PAINT CONTAINER

Thomas A. Gallagher, Chagrin Falls, Ohio; Paul Knowlton, Tinley Park, and Leon Patarini, Palus Hills, both of Ill., assignors to Van Dorn Company, Cleveland, Ohio

Filed Nov. 13, 1987, Ser. No. 120,471

Int. Cl.[4] B65D *43/00*

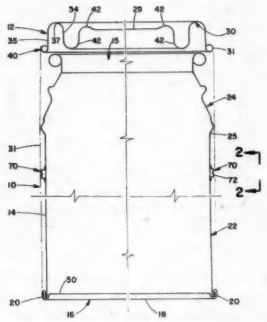
U.S. Cl. 220—83 **17 Claims**

1. A cylindrical metal container in combination with a removable, resealable lid comprising;

(a) said lid having a generally circular configuration with an annular sealing groove formed adjacent its peripheral edge; said sealing groove defined by continuous longitudinally-extending inner and outer sealing walls with a bight wall therebetween thus forming an inverted, U-shaped groove;

(b) said container having a generally cylindrical, longitudinally-extending side wall, a circular bottom wall at one end of said side wall and a generally circular top opening at the other end of said side wall, said container side wall further defined by a configured rim portion adjacent said top end and a generally constant diameter cylindrical body portion extending from said bottom wall to said rim portion;

(c) said rim portion adapted to receive said lid for closing said top opening and further including (i) said top end of said side wall curled in a bead for sealing engaging said



sealing walls of said lid, said outer sealing wall of said lid establishing approximately an annular line contact with said container's bead; (ii) a longitudinally-extending sealing wall segment generally parallel to said container's side wall and positioned radially inwardly therefrom adjacent to and depending from said curled bead and adapted to be in contact over a substantial portion of the length thereof with said lid's inner sealing wall to define a longitudinally-extending, frictional sealing area between said inner sealing wall of said lid and said sealing wall segment, and (iii) a frusto conical wall segment extending from said sealing segment to said container's side wall and having rigidizing means formed therein for principally resisting longitudinal deflection of said rim portion.

4,880,132

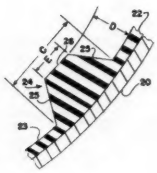
PROCESS FOR PLATING ADHERENT CO-DEPOSIT OF ALUMINUM, ZINC, AND TIN ONTO METALLIC SUBSTRATES, AND APPARATUS

Lester G. Coch, Northport, and Arnold Satow, Bayside, both of N.Y., assignors to McGean-Rohco, Inc., Cleveland, Ohio

Filed Jul. 15, 1988, Ser. No. 219,604

Int. Cl.[4] B65D *6/10*

U.S. Cl. 220—83 **5 Claims**



1. A plating barrel comprising:

a cylindrical mid-section with a frustoconical upper end and a concave circular lower end co-axially aligned along a

center axis, said plating barrel being rotatable about said center axis, said center axis projecting at a sufficient angle with the horizontal to provide the desired degree of cut or polish for the metal part being plated;

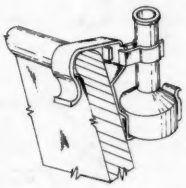
a plurality of parallel spaced baffles aligned along the inner surface of said cylindrical mid-section, said baffles projecting radially inwardly from said inner surface and extending axially along the length of said mid-section, the extent of said inward radial projection of said baffles being from about 1.5% to about 5% of the major inner diameter of said cylindrical mid-section, the chord length of each of the arcs aligned normal to said center axis and formed by the intersection between said baffles and said inner surface of said mid-section being from about 4% to about 15% of the major inner diameter of said mid-section.

4,880,133

BUD VASE AND ATTACHMENT BRACKET

Dolores M. Cullinane, Box 75401, Northgate Sta., Seattle, Wash. 98125

Filed Jul. 27, 1988, Ser. No. 224,811
Int. Cl.[4] A01G *5/00*
U.S. Cl. 220—85 H **2 Claims**



1. A vase having a bulbous lower portion and a neck portion, said lower portion having a planar bottom, said vase being adapted to be held by a bracket, said bracket being attachable to structure having a top edge and a front surface oriented essentially 15° off of vertical, said bracket being attachable to said top edge and comprising:

a clamp and

a vase clip

said clamp having a surface for supporting said vase by contact with said bottom and being configured so that with said bracket attached to said structure said surface for supporting is horizontal,

said clamp further having detent means for contacting said lower portion and holding said bottom in contact with said surface for supporting,

said vase clip being detachably attachable to said clamp and said neck portion, whereby when said bracket is attached to said top edge, said bottom is on said surface for supporting, said detent means is holding said bottom on said surface for supporting and said neck is attached to said clamp by said vase clip, said vase is attached to said structure and oriented vertically.

4,880,134

PROTECTIVE CAP ASSEMBLY

Theodore N. Wood, Jr., R.D. 1, Box 578, Harveys Lake, Pa. 18618

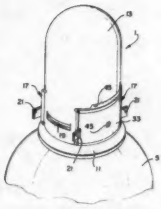
Continuation-in-part of Ser. No. 214,614, Jul. 1, 1988. This application Sep. 20, 1988, Ser. No. 246,637
Int. Cl.[4] B65D *41/02*
U.S. Cl. 220—85 P **14 Claims**

1. A cap assembly for protecting an outwardly extending valved fitting provided with an externally threaded cap ring at the discharge end of a fluid container, the assembly comprising:

(a) an adaptor ring provided with internal threading for threaded engagement with the external threading of the cap ring;

(b) a cap for enclosing and protecting the valved fitting;

(c) latch means carried by the cap for permitting longitudinal detachable engagement of the cap and adaptor ring



when the adaptor ring is in threaded engagement with the cap ring; and

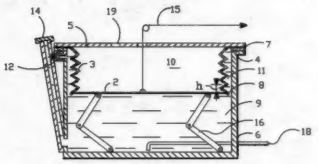
(d) the latch means being movable outwardly of the cap to permit the cap to receive the adaptor ring therein, and thereafter movable inwardly towards the cap to secure the cap to the adaptor ring.

4,880,135

EVAPORATIVE EMISSION CONTROL OF LIQUID STORAGE TANKS USING BELLOW SEALING SYSTEMS

In-Meei Neou, 3444 Murdoch Ct., Palo Alto, Calif. 94306

Filed Jul. 15, 1987, Ser. No. 73,457
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—85 VS **6 Claims**



2. A liquid storage tank with evaporative emission control including a bellow having an open and a closed end;

means for securing the open end of the bellow to the top of said tank with the closed end adapted to float on the surface liquid in said storage tank;

said bellow dividing the interior said tank into an externally vented air space and a closed liquid and vapor space including a space reserve for thermal expansion of the liquid and vapors; and

articulated baffle plates flexibly attached between the bellow and said tank in the liquid vapor space for damping fluid vibrations and sloshing.

4,880,136

CONTAINER CLOSURE

Nickolaus Englert, 51 Betula Avenue, Vermont, Victoria, 3133, Australia

Filed Nov. 29, 1988, Ser. No. 277,286
Claims priority, application Australia, Nov. 30, 1987, P15657
Int. Cl.[4] B65D *51/18*
U.S. Cl. 220—253 **1 Claim**

1. A closure for a can, said closure comprising a substantially flat disc adapted to fit on said can and having an opening therethrough, said disc being rotatable about its central axis to align said opening with an opening in said can such that further rotation causes said disc to cover said can opening; said disc

having a depending peripheral rib to assist in locating and retaining said disc in position relative to said can, and two lugs

projecting axially upwardly therefrom with the location and spacing of said lugs enabling an outer end of a lift tab of said can to be located and held therebetween.

4,880,137

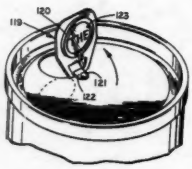
RECLOSABLE SELF-OPENING CAN END

Robert A. Wells, 107 N. Lakeside Dr., Kennesaw, Ga. 30144

Division of Ser. No. 207,141, Jun. 15, 1988. This application Apr. 14, 1989, Ser. No. 339,086

Int. Cl.[4] B65D *41/32*

U.S. Cl. 220—269 **3 Claims**



1. Selectably reclosable easy-opening apparatus for a container, cmprising:

a container wall;

a selectably openable panel defined in said wall at least in part by a selectably separable region of predetermined weakness formed in the container wall;

a unitary opening and reclosure member pivotably attached to said wall and having a hinge connection permitting selectable movement of said member on a first path substantially normal to the container wall;

said pivotable attachment allowing the unitary opening member to undergo movement on a second path substantially parallel to said container wall;

said opening member having a finger portion overlying at least a portion of said operable panel in position to apply force downwardly against said openable panel in response to movement of the opening member about said hinge connection along said first path, thereby separating said separable region and displacing said panel downwardly relative to said wall, so that an opening is formed on said wall by separation and downward displacement of said panel;

said unitary opening member having a reclosure portion confronting the container wall at a location displaced from said openable panel while said finger portion overlies at least a portion of said openable panel;

said reclosure portion having a deep recess region formed on the underside thereof;

said deep recess region defining a premium message region disposed to conceal the premium message from view before said separable region is separated, the premium message region becoming exposed to view as said opening member is moved on said path to open said container wall; and

said reclosure portion and said recessed region of said reclosure portion being located on said opening member in relation to said pivotal attachment so as to be selectably registrable with said opening by pivoting said opening member on said second path after said opening is formed;

so that said container may be first opened by hinging the opening member on said first path, and thereby also exposing said premium message contained within said recessed portion of said underside of said reclosure portion, and thereafter may be reclosed by pivoting said opening member on said second path and urging said reclosure portion into removable engagement with the container wall adjacent said opening therein.

4,880,138

COVER ASSEMBLY FOR A DRUM COMPOSED OF SYNTHETIC RESIN

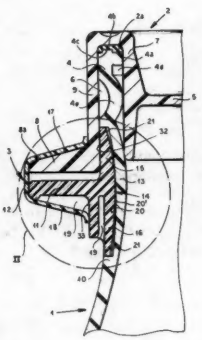
Pierre Pfeiffer, Drulingen; Benoit Cheval, Saverne, and Paul Sigwalt, Drulingen, all of France, assignors to Sotralentz S. A., Drulingen, France

Filed Nov. 4, 1988, Ser. No. 267,414

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737884

Int. Cl.[4] B65D *45/32, 1/48*

U.S. Cl. 220—320 **13 Claims**



1. A drum, comprising:

a drum body of thermoplastic synthetic resin material formed at an end of said body integrally with a neck set inwardly of said body and defining a mouth of said barrel, and a transition section between said neck and said body;

a generally T-section connecting ring secured to said transition section below said mouth, said connecting ring having a pair of flanges forming a crossbar of the T of said T-section abutting said neck and a web projecting outwardly from said crossbar;

a cover formed with an annular trough defined between inner and outer walls flanking said neck and tightly fitted over said neck and into said mouth, said cover being integrally provided with a cover bottom spanning said end of said body and recessed therein below said mouth, said outer wall being formed at a free end thereof with an outwardly extending shoulder generally parallel to and juxtaposed with said web, said outer wall in a region of said shoulder overlying one of said flanges extending toward said mouth; and

a tensionable clamping ring of substantially U-section engaging over said web and said shoulder and clamping same upon tensioning of said clamping ring, said U-section being defined by a pair of flanks of said clamping ring, one of said flanks engaging said shoulder in said region and

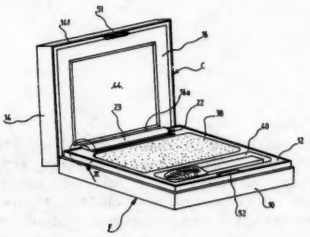
bearing inwardly upon said free end where said free end overlies said one of said flanges upon tensioning of said clamping ring, the other flank of said pair of flanks bearing inwardly upon the other of said flanges upon tensioning of said clamping ring.

4,880,139

CASING WITH INVISIBLE HINGE

Bernard Jumel, and Charles Pileur, both of Neuilly-sur-Seine, France, assignors to Yves Saint Laurent Parfumes, France

Filed Feb. 3, 1988, Ser. No. 151,990
Claims priority, application France, Feb. 4, 1987, 87 01352
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—337 **12 Claims**



1. Casing, in particular for cosmetics, comprising
two half-casings linked by a hinge enabling said half-casings to pivot about an axis with respect to each other,
said hinge including two pivots carried by one of said half-casings and two receptacles on the other half-casing and in which both pivots can swivel,
the half-casing which includes the two receptacles being constituted by two elements, one outer and one inner element, which can be fitted,
wherein both receptacles are located in one of the side walls of the inner element and open outwardly to permit the free introduction of the pivots respectively into the two receptacles when the two half-casings are fitted together,
the outer element when fitted on the inner element completely closing both receptacles at one of its corresponding side walls which maintains the pivots in their respective receptacles, whereby the hinge is rendered invisible from the outside, and
wherein said inner element includes means for totally covering said hinge from outside, even when said one half-casing is opened, whereby said hinge is rendered invisible from the outside, even when said one half-casing is opened.

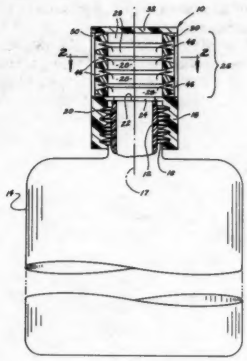
4,880,140

FILTER-SEPARATOR POUR-OUT CAP

David E. Solomon, 3415 Woodlea, Ann Arbor, Mich. 48103, and William J. Hillegas, 3630 Middleton, Ann Arbor, Mich. 48105

Filed Apr. 26, 1988, Ser. No. 186,507
Int. Cl.[4] B65D *37/00*
U.S. Cl. 220—371 **14 Claims**

1. A filter-separator pour-out cap for a container comprising an attachment section for attaching the cap to a container, a filter-separator section, and means for supporting said filter-separator section on a container via said attachment section, said filter-separator section having an upstream face at which flow from the container enters the filter-separator section and a downstream face at which flow exits the filter-separator section, said filter-separator section comprising successive elements that are spaced axially apart from each other and are constructed and arranged to present at the upstream face of the filter-separator section juxtaposed uniformly spaced apart sharp edges that define the entrances of openings that pass through the filter-separator section from the upstream face to the downstream face, the spacing distance between immediately consecutive elements being such that substantially identical spacing distances are provided between juxtaposed edges of immediately consecutive elements at the upstream face and



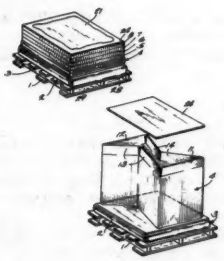
the spacing distance between immediately consecutive elements along said openings from just beyond said juxtaposed edges to the downstream face exceeds the spacing distance that exists between the juxtaposed edges of immediately consecutive elements at the upstream face.

4,880,141

PALLETS SUPPORTED REINFORCED CONTAINER

Hans K. Gossler, 9535 Walnut Dr., and Chester K. Guynn, 7406 N. Hawthorne La., both of Munster, Ind. 46321

Filed Mar. 10, 1989, Ser. No. 321,679
Int. Cl.[4] B65D *19/20*
U.S. Cl. 220—464 **12 Claims**



1. A container assembly comprising, a rigid pallet base, a first floor board fastened to and covering floor of said pallet and end flaps foldable to a vertical position, a second floor board positioned normal to and fastened to and covering said first floor board with end flaps foldable to a vertical position to form continuous side walls with said first end flaps around said floor of said pallet, a tubular member having a rectangular cross-section positioned around said vertically oriented end flaps forming double thickness walls, four interlocked reinforced panels positioned inside the said end flaps forming reinforced side walls, a fluid tight bag received inside said side panels to form a fluid tight chamber in said container, a flat cover received in the top of said container, foldable flaps on

the top of said tubular member foldable to hold the top in place.

4,880,142

POWDER WEIGHING MIXER AND METHOD THEREOF

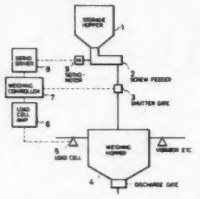
Noboru Higuchi; Keizo Matsui; Chuzo Kobayashi, and Hiroshi Ohnishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 4, 1988, Ser. No. 188,343

Claims priority, application Japan, May 12, 1987, 62-113429; May 14, 1987, 62-115892; May 14, 1987, 62-115893

Int. Cl.[4] B67D 5/08

U.S. Cl. 222—56 6 Claims



3. A powder weighing method, comprising the steps of:

setting a target weight of a powder to be measured;

regulating a flow rate of said powder supplied from a supply container to a receiving container through a flow regulator;

measuring a weight of said powder supplied to said receiving container;

determining a deviation between said measured weight and said target weight;

determining a time variation of said deviation;

performing a fuzzy inference upon said deviation and said time variation to produce a desired flow rate in a next control cycle, wherein membership functions of said deviation and said time variation used in said fuzzy inference are divided into groups having smaller intervals for smaller values of said deviation and said time variations; and

in said next control cycle, again regulating said flow rate in response to said desired flow rate and repeating said measuring step said two determining steps and said performing step.

4,880,143

DISPENSER AND COMPONENTS FOR HIGH VISCOSITY FOAM PRODUCTS

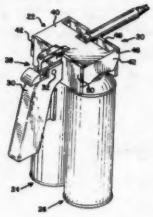
Pat L. Murray, Minooka; Robert Braun, New Lenox, and Dawn McNamara, Lockport, all of Ill., assignors to Insta-Foam Products, Joliet, Ill.

Filed Oct. 20, 1988, Ser. No. 260,289

Int. Cl.[4] B67D 5/52

U.S. Cl. 222—135 7 Claims

7. A mixing and dispensing gun for aerosol containers comprising, in combination, a container positioning unit, a trigger mechanism and a mixing and dispensing assembly, said container positioning unit comprising, including a center frame portion and opposed carrier plates each having slots formed therein defined by support margins for engagement of a portion of an associated container in a groove between a domed container end portion of and a container valve support assembly, said container positioning unit further including a handle extending outwardly and downwardly from said frame, a trigger mounted for pivotal movement with respect to said handle and including a lower portion adapted to be engaged by the fingers of the user and an upper portion arranged for downward movement when the lower the portion is pulled to the rear, a combination container cover unit and trigger plate mounted for pivotal movement with respect to said positioning unit, said trigger plate having a downwardly directed surface adapted to engage and depress a mixing and dispensing unit positioned therebeneath, said mixing and dispensing assembly including a rigid mixer unit having a main body portion and a pair of removable component inlet elbows, said main body portion including opposed inlet passages and an enlarged diameter outlet passage, a portion of said outlet passage being



threaded for reception of an associated discharge nozzle, said main body portion further including positioning and latching plates extending outwardly of said main body and above said inlet passages, each of said elbows including a tubular vertical and a tubular horizontal passage sections and an alignment and latching element having a flat top surface adapted to engage said latching plate, whereby said elbows may be positioned, aligned, inserted and locked within said body.

4,880,144

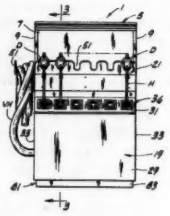
CONSOLE FOR HOLDING AND HOUSING CLEANING AND LUBRICATION EQUIPMENT

Robert F. Shea, Florissant, Mo., assignor to McNeil (Ohio) Corporation, St. Paul, Minn.

Filed Oct. 5, 1988, Ser. No. 253,568

Int. Cl.[4] B67D 5/64, 5/06

U.S. Cl. 222—173 12 Claims



1. A console unit for holding and housing a plurality of lubricant dispensers, lubricator holes attached to the dispensers, and one or more vacuum units on rollers, comprising:

a podium-like structure having a front wall, two side walls, a top wall and an open bottom;

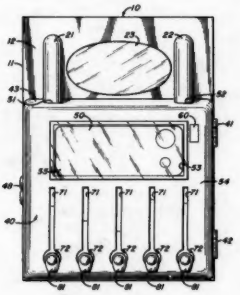
a lubricator hose housing attached to the front wall of the podium-like structure, having a front wall- spaced forward from the front wall of the podium-like structure, a top wall with aperture means therein, and side walls;

means for releasably holding said dispensers on the front wall of the podium-like structure above the top wall of the hose housing with the lubricator hoses extending down from the dispensers through said aperture means in the top wall of said hose housing; and

a lower compartment in the podium-like structure housing said one or more vacuum units, said lower compartment being partially defined by the front and side walls of the

podium-like structure and the open bottom of the podium-like structure whereby said vacuum unit can be rolled in and out of the compartment along a surface on which the podium-like structure rests.

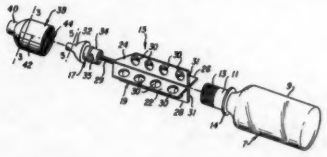
4,880,145
SHOWER ACCESSORY
Richard P. McManus, 1200 Kapuahi St., Makwao, Hi. 96768
Filed Jan. 4, 1988, Ser. No. 140,712
Int. Cl.[4] B67D *5/06*
U.S. Cl. 222—192 **3 Claims**



1. A dispensing assembly conformed for use in a shower, comprising:
- a substantially rectangular backplate conformed for releasable attachment to the walls of said shower and defined by an upper surface portion;
- a rectangular cover defined by a forward wall and a peripheral edge extending thereabout pivotally engaged to said back plate to align over said surface portion thereof;
- a radio assembly;
- an enclosure formed in said forward wall of said cover conformed for receiving said radio assembly therein;
- a water impervious membrane adhesively secured to said cover in alignment over said enclosure and said radio assembly to form an outer covering therefor for shielding said radio assembly from water;
- a battery housing secured to said backplate in alignment within said cover upon the pivotal articulation of said cover against said back plate, said battery housing including electrical connecting means to said enclosure;
- a plurality of engagement means secured to said cover opposed alignment towards said backplate; and
- a corresponding plurality of liquid dispensers each respectively engageable to a corresponding one of said engagement means and each provided with a dispensing spout communicating to the exterior of said cover.

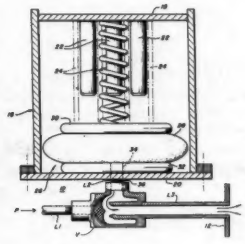
4,880,146
DROP DISPENSER WHICH AUTOMATICALLY STIRS THE CONTENTS OF THE DISPENSER WHEN THE CAP IS REMOVED
J. S. Hudgins, 321 Harbor Pointe Dr., #14, Mt. Pleasant, S.C. 29464
Filed Jun. 8, 1988, Ser. No. 203,939
Int. Cl.[4] B67D *5/06*
U.S. Cl. 222—192 **14 Claims**

1. A drop dispenser comprising (i) a container having an externally threaded portion at its open end; (ii) a nozzle/impeller assembly comprised of a drop nozzle rotatably connected to an impeller mixing means, said impeller mixing means being positioned inside said container and at least a portion of said drop nozzle extending beyond the open end of said container; (iii) an opening through the drop nozzle providing communication between the inside and outside of said container; and (iv) a cap having internal threads for threaded engagement with the external threads of said container, means within the cap receiving and engaging the end of said drop nozzle so that when said cap is unscrewed, the nozzle/impeller



assembly is rotated and means for rotatably mounting the nozzle/impeller assembly in the container which prevents the axial removal of the assembly from the container when the cap is unscrewed.

4,880,147
AIR BLAST GENERATOR
Peter J. Tolan, 30 Greenfield Lane, Scituate, Mass. 02066
Filed Mar. 7, 1984, Ser. No. 587,204
Int. Cl.[4] B65G *53/38*
U.S. Cl. 222—195 **10 Claims**

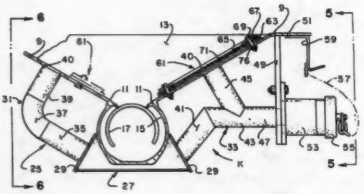


1. An air burst generator, comprising means for confining pressurized gas in a container, means for releasing said pressurized gas to a predetermined location, and means for rapidly mechanically reducing the volume of the container when substantially simultaneously with the actuation of said means for releasing the gas, whereby the gas is forced out of the container at a velocity much greater than the velocity with which the gas would leave the container without such volume reduction.

4,880,148
FLUIDIZATION KIT FOR PNEUMATIC DISCHARGE OUTLET
Kenneth D. Schmidt, St. Charles, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.
Filed Feb. 26, 1988, Ser. No. 161,185
Int. Cl.[4] B65G *69/06*; B67D *5/58*
U.S. Cl. 222—195 **6 Claims**

1. In a hopper discharge outlet adapted to be attached to the bottom of a hopper car or the like, said outlet including an outlet pan having downwardly and inwardly converging side walls, a control valve in operative association with the lower portion of said side walls, said control valve being in communication with said outlet for the selective discharge of a lading carried in said hopper car, the improvement comprising: a fluidized outlet kit for retro-fit installation on said outlet pan, said outlet pan having an outlet tube at the bottom thereof with said control valve therein, said kit having two air permeable fluidizing membranes attached to said side walls of said outlet pan on opposite sides thereof, a space between each of said

membranes and its respective side wall, said side walls each having an opening therein in communication with said space, a manifold assembly comprising a saddle-shaped central manifold section extending around and beneath said outlet tube, said outlet tube forming a wall of the manifold and said manifold



having manifold arm sections extending upwardly from said central manifold section on opposite sides thereof for connection to said side walls so as to supply air under pressure to said space, said saddle-shaped central manifold being in close proximity to said outlet tube thereby to be within AAR clearances.

4,880,149

LIQUID METERING DEVICE

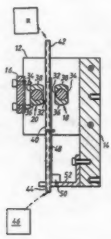
John Scholefield, Kirkintilloch, and Robert Johnston, Stewarton, both of Scotland, assignors to Automated Bacteria Counting Limited, Glasgow, Scotland

Filed Oct. 1, 1987, Ser. No. 115,062

Claims priority, application United Kingdom, Feb. 4, 1986, 8602683

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—207 **8 Claims**



1. A liquid metering device comprising:

a resilient conduit,

means for introducing a liquid into said conduit,

means for constricting said conduit, including a first rotatable member having a curved surface and having a flat portion formed on said curved surface, and

a second member, co-operable with said first rotatable member, and disposed relative to said first member and said conduit, such that said conduit may be constricted therebetween, whereby rotation of said first rotatable member causes said conduit to be alternately constricted when said curved surface of said first rotatable member impinges upon said conduit, and released when said flat portion is presented to said conduit, and

means for varying the positions of said conduit relative to said first rotatable member and said second member.

4,880,150

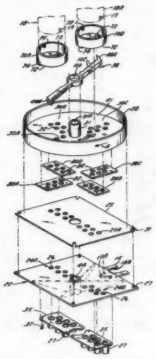
FILLING MACHINE FOR DISPENSING PARTICULATE MATERIAL

James P. Navin, Racine; Ronald A. Shilhavy, Sturtevant, and Gary M. Christensen, Kenosha, all of Wis., assignors to Spee-Dee Packaging Machinery Inc., Sturtevant, Wis.

Filed May 27, 1988, Ser. No. 199,854

Int. Cl.[4] G01F *11/10*

U.S. Cl. 222—346 **25 Claims**



1. A filling machine for repeatedly dispensing predetermined amounts of flowable particulate material comprising:

a stationary hopper having a spout;

a rotatable upper plate beneath said spout and rotatable about a vertical axis, said upper plate having a receiving hole therethrough which is radially offset from said axis and alignable with said spout;

a stationary bottom plate beneath said upper plate and having a dispensing hole therethrough which is radially offset from said axis and out of registery with said spout and alignable with said receiving hole;

said receiving hole being movable as said upper plate rotates between one position where said receiving hole is aligned with said about but not with said dispensing hole and another position wherein said receiving hole is aligned with said dispensing hole but not with said spout;

said flowable particulate material flowing under the force of gravity from said spout into said receiving hole when said receiving hole is in said one position and said flowable particulate material flowing under the force of gravity from said receiving hole into and through said dispensing hole when said receiving hole is in said another position;

means above said upper plate for directing excess material accumulated on said upper plate into said receiving hole after said receiving hole moves from said another position above said dispensing hole toward said spout but before said receiving hole reaches said one position;

and first means for inhibiting leakage of said material from a space between said spout and said upper plate.

4,880,151

PRESSURIZED SPRAY PAINT CONTAINER

Willard W. Shepherd, 3500 Shepherd St., Los Angeles, Calif. 90022

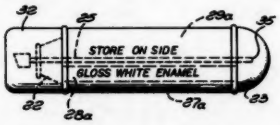
Filed Oct. 31, 1988, Ser. No. 264,830

Int. Cl.[4] B65D *6/34*

U.S. Cl. 222—394 **1 Claim**

1. A unitary, non-rechargeable, hand held, self-contained pressurized spray paint container having a generally cylindrical configuration about a container axis with a top and a bottom, a spray control nozzle mounted directly on said container at said top of said container and a transport tube positioned

within said container and having inlet and outlet ends, with said outlet end connected to said control nozzle, and with said container charged with a mixture of paint solvent, paint solids, and propellant, which paint solids settle in said paint solvent toward the lowestmost portion of said container under the



influence of gravity, with said container having an outwardly bulged bottom so that the container can be operated with one hand for spraying and can be positioned on its side between spraying events and cannot be rested in an upright position on said bottom.

4,880,152

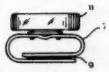
PORTABLE TAPE DISPENSER UNIT

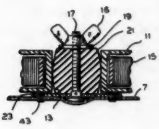
Richard Trankle, 2905 Druid Dr., Plano, Tex. 75075

Filed Jan. 11, 1988, Ser. No. 142,512

Int. Cl.[4] B65H *75/40*

U.S. Cl. 224—162 **6 Claims**





1. A device for retaining a dispenser of material and attaching it to its user, said dispenser having a cavity and cavity walls therein, comprising:

support means attachable to the user for supporting said dispenser;

a resilient core attached to said support means and extending into said dispenser cavity, said core comprising a cylinder which is deformable toward said cavity walls;

means for deforming said core so that it frictionally engages said dispenser and fixedly joins said dispenser to said support means, said deforming means comprising a threaded bolt running through said core and a threaded nut thereon, whereby tightening of said nut against said core on said threaded bolt causes said core to distend radially from said bolt.

4,880,153

DEVICE FOR USE IN EXPLOSIVE WELDING OF TWO OVERLAPPING TUBULAR OR ANNULAR ELEMENTS

Rune Adolfsson, Boras, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Filed Apr. 22, 1988, Ser. No. 192,328

Claims priority, application Sweden, Apr. 29, 1987, 8701792

Int. Cl.[4] B23K *27/00*

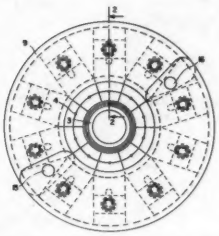
U.S. Cl. 228—2.5 **5 Claims**

1. A backup device for use in explosive welding of two telescoped cylindrical members by means of an explosive charge located inside one of said members adjacent overlapping portions of said cylindrical members said device comprising:

(a) a relatively stationary housing surrounding said cylindrical members;

(b) block-like support members radially displaceable within said housing;

(c) elements radially displaceable within said housing, resting upon and displaceable with said support members, and engaging said housing which defines radial friction surfaces; and



(d) means for selectively varying frictional forces between said friction surfaces;

whereby, upon explosion said support members and elements are displaced radially outwardly against friction forces provided by interengaging of said frictional surfaces of said housing and elements, whereby the sole means of absorbing said explosion is the frictional forces.

4,880,154

BRAZING

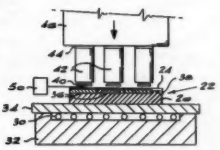
Klaus Tank, 9 Warbleton Avenue, Essexwold, Bedfordview, Transvaal, South Africa

Filed Apr. 1, 1987, Ser. No. 34,218

Claims priority, application South Africa, Apr. 3, 1986, 86/2471

Int. Cl.[4] B23K *31/04*

U.S. Cl. 228—122 **4 Claims**



1. A method of manufacturing a generally flat cutter wing for a drag bit which has two or more cutter wings disposed generally radially at the leading end of the bit, the wing having a stepped configuration and comprising a plurality of generally flat cutters secured by brazing to a generally flat steel body, each cutter being composed of a PCD layer on a carbide substrate, wherein the brazing takes place either directly between mating surfaces of the carbide substrates and the steel body or between mating surfaces of the carbide substrates, intermediate carbide elements and the steel body, and wherein the method comprises the following steps:

(a) locating the cutters in recesses in the steel body with brazing shims interposed between the mating surfaces which are to be brazed to one another to form a generally flat cutter wing structure;

(b) applying external force to the cutters in a direction transverse to the flat structure to urge the cutters towards the steel body;

(c) heating the steel body to a uniform temperature across the extent of its mating surface at which brazing is to take place, such heating taking place inductively and by means of an induction coil located adjacent a surface of the steel body which is remote from the mating surface at which brazing is to take place;

(d) continuously monitoring the local temperature of the PCD layer during heating;

(e) controlling the energization of the induction coil so that said local temperature does not exceed the temperature at which the PCD layer suffers temperature degradation; and

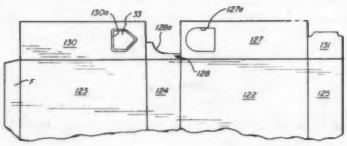
(f) after the brazing shims have melted against the mating surfaces which are to be brazed, de-energizing the induction coil and permitting the flat cutter wing structure to cool slowly to ambient temperature.

4,880,155

COLLAPSIBLE FOLDABLE DISPENSING CARTON

James L. Stone, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Oct. 18, 1988, Ser. No. 259,166
Int. Cl.[4] B65D *39/04*
U.S. Cl. 229—125.09 **4 Claims**



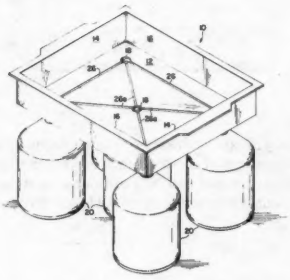
1. A collapsible, folded, dispensing carton comprising a pair of opposed first wall panels; a pair of opposed second wall panels, said pairs being foldably interconnected; a pair of top closure first flaps foldably connected to upper edges of the first wall panels; a pair of top closure second flaps foldably connected to upper edges of the second wall panels, said first and second flaps being in overlapping relation when said carton is in a set up mode whereby one first flap is an outermost flap, the outermost flap being provided with a dispensing opening and one of the other flaps being provided with means whereby the dispensing opening is in communication with the interior of the carton when the latter is in a set up mode; and a fitment of thin material mounted on an exposed surface of the outermost flap and in registry with the dispensing opening, said fitment including a base section affixed to the exposed surface circumjacent the dispensing opening, and a cover section adjustable relative to the base section between open and close positions; said carton, when in a collapsed mode, having a first wall panel and an unfolded first flap connected thereto and a second wall panel and an unfolded second flap connected thereto being in substantially coplanar relation and defining a first plane, and the remaining first and second wall panels and the first and second flaps connected thereto being in substantially coplanar relation and defining a second plane, said planes being disposed in proximate, face to face, substantially parallel relation, the outermost flap being in said first plane and the dispensing opening thereof being opposite a second flap in the second plane, the latter second flap being provided with a cut-out in substantial registry with the said dispensing opening for accommodating a portion of the fitment when the cover section is in the close position and the carton is in the collapsed mode whereby the thickness of the collapsed carton is substantially uniform throughout.

4,880,156

OIL COLLECTION AND DISPOSAL DEVICE

Steven A. Wallet, 14 Finch Run, Avon, Conn. 06001

Filed Jul. 1, 1988, Ser. No. 214,183
Int. Cl.[4] F16N *31/00*
U.S. Cl. 232—43.1 **10 Claims**



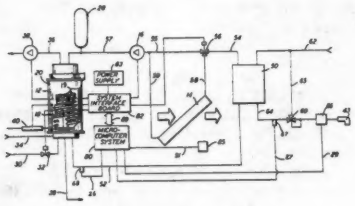
1. A device for collecting and disposing of used automotive motor oil and the like; said device comprising on oil collection pan having a horizontal and substantially generally flat bottom wall bounded by a marginal generally upright integral side wall defining a broad upwardly exposed opening for freely accepting the downward discharge of used motor oil from the drain opening of an automotive engine or the like, said pan bottom wall having at least three similar discharge openings in horizontally spaced relationship so as to accommodate three plastic motor oil bottles therebeneath in upright attitude and in similarly spaced relationship so as to communicate with and receive oil respectively from said discharge openings through their top openings, the horizontal spacing of said discharge openings and bottles being such that the bottles are capable of serving as legs for the pan and supporting the same horizontally in stable relationship with and beneath the drain plug opening, and a means for detachably securing the bottles in position beneath the pan with their top openings respectively in communication with said pan bottom openings as aforesaid.

4,880,157

CAPACITY CONTROL FOR INTEGRATED FURNACE

Jay L. Boot, Manlius; Chester D. Ripka, East Syracuse, and Ian M. Shapiro, Fayetteville, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 17,302, Feb. 20, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 218,411
Int. Cl.[4] F22B *35/00*
U.S. Cl. 236—25 R **2 Claims**



1. A capacity control system for an integrated heating system for space and domestic hot water heating having a burner, a coil for receiving heat from the burner, and a primary fluid loop connected to the coil, the primary fluid loop having a heat exchanger for transferring heat to a space and a tankless tube-

in-tube heat exchanger receiving heat from the primary loop for transferring heat to a secondary fluid loop of a domestic hot water system, the control system comprising:

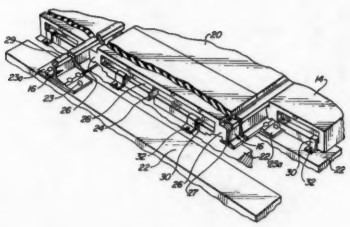
a burner flame control means for controlling the pulsing of the repeated ignition and combustion termination of the burner wherein the burner includes an infrared burner which allows maximum radiant heat transfer capacity to the coil to be reached quickly, said burner flame control means including a flow switch for detecting absolute fluid flow of the domestic hot water in the secondary fluid loop of the domestic hot water system and providing a first "on" signal to a microprocessor means indicative of the presence of hot water flow in the secondary fluid loop of the domestic hot water system, and a temperature sensor means for detecting the temperature of the fluid at an outlet of the coil receiving heat from the burner and providing a second signal to the microprocessor means indicative of the temperature of the fluid in the primary fluid loop whereby said microprocessor provides an output signal to control the pulsing of said repeated ignition and combustion termination of the burner so that the fluid in the loop, wherein the fluid in the primary loop flows in series through the primary loop coil, the heat exchanger, and the tube-in-tube heat exchanger, is maintained at a desired temperatures.

4,880,158

SURFACE GRADE CROSSING STRUCTURE

Louis V. Cook, c/o Anderson Cook Enterprises, P.O. Box 656, Mundelein, Ill. 60060

Filed Nov. 27, 1987, Ser. No. 125,706
Int. Cl.[4] E01B *2/00*
U.S. Cl. 238—8 **14 Claims**



1. A surface grade crossing structure for use with a railway track consisting of a pair of spaced, parallel rails, each rail having a base, a web portion, and a rail head, said rails being secured on a plurality of spaced, elongated ties situated perpendicular to said rails and each having an upwardly facing substantially planar surface, said surface grade structure comprising:

a unitary pad of solid elastomeric material with an upper substantially planar surface and a lower substantially planar surface adapted to facially engage the upwardly facing surface of the ties

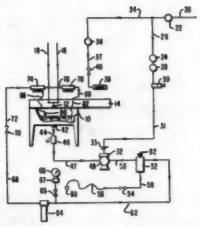
with the pad upper surface substantially coplanar with the heads of said rails, said pad further having opposite parallel edges which, with the pad operatively positioned between the spaced rails, are spaced apart a distance greater than the spacing between the rail heads, and a single notch means in the pad for permitting folding of two portions of the pad relative to each other sufficiently without said two portions bending to reduce the effective spacing between the opposite parallel pad edges so that with the one parallel edge adjacent the web portion on one rail the other parallel edge can be lowered beneath the head on the other rail without interference between the other parallel edge and other rail head whereupon the pad can be relaxed to bear the lower pad surface facially against the upwardly facing tie surfaces.

4,880,159

GLUE HEAD FLUSHING SYSTEM

James B. Coffey, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 7, 1987, Ser. No. 105,420
Int. Cl.[4] B05B *17/04, 15/02*
U.S. Cl. 239—1 **11 Claims**



10. A method of flushing material from adhesive applying heads in a flushing system comprising the steps of:

providing a reservoir;

connecting a supply of solvent to the reservoir in a pressurized condition;

providing a solvent manifold having a quick-disconnect coupling means with internal valves and connecting said solvent manifold to the supply of solvent,

providing an air manifold with a supply of air connected thereto;

connecting the adhesive applying heads to the quick-disconnect coupling means of the solvent manifold for circulating solvent through the heads and for flushing adhesive material from the heads while maintaining said pressurized condition of said flushing system with said internal valves,

pumping solvent by means of controlling the pumping automatically with said supply of air in a path from the reservoir through piping and circulating the solvent through said solvent manifold and through the adhesive applying heads back to the reservoir; and

connecting the applying heads to the air manifold for cleaning the heads of any material or solvent remaining therein after flushing adhesive material from the heads with solvent through the solvent manifold.

4,880,160

TORSIONAL LINK BOOM SUSPENSION FOR REDUCING UNWANTED BOOM MOTION

Jon M. Patterson, Horicon, Wis., and Douglas P. Brown, Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 24, 1988, Ser. No. 197,941
Int. Cl.[4] B05B *1/20*
U.S. Cl. 239—167 **9 Claims**

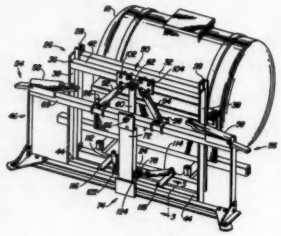
1. A boom support for a framed vehicle adapted for forward movement over the ground, comprising:

a support frame connected to the vehicle frame;

a boom frame; and

means for supporting the boom frame from the support frame including an upright torsional link having an axis and means connecting one end of the torsional link to the support frame for securing said one end against rotation about the link axis, and means connecting the opposite end of the link to the boom frame, the link yieldingly biasing

the boom frame to a normal operating position while accommodating rocking movement of the boom frame



from the operating position about the link axis for isolating vehicle yaw from the boom frame.

4,880,161

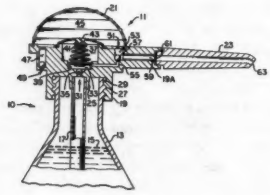
FOAM DISPENSING DEVICE

H. Earl Wright, Decatur, Ill., assignor to Earl Wright Company, Decatur, Ill.

Continuation-in-part of Ser. No. 695,185, Jan. 28, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 934,639

Int. Cl.[4] B05B *7/04*; B65D *37/00*

U.S. Cl. 239—330 **1 Claim**



1. A foam dispensing device for mixing a foamable liquid with ambient air and dispensing a foam, the device comprising:

(a) a liquid reservoir adapted to contain a quantity of foamable liquid which continuously remains at atmospheric pressure during foam dispension;

(b) a compressible air supplying means adapted to supply air at superatmospheric pressure when compressed and to replenish its air supply when released;

(c) a mixing chamber in which the foamable liquid from the liquid reservoir and the air from the air supplying means can mix to form a foam;

(d) a compressible liquid pumping chamber adjacent to but separated from the air supplying means by a flexible diaphragm which depresses to pressurize the liquid pumping chamber when the air supplying means is compressed and which returns to its original position by the natural resiliency of the diaphragm and without the action of a coiled spring to vacuumize the liquid pumping chamber when the air supplying means is released;

(e) a valved passage between the liquid reservoir and the liquid pumping chamber which closes when the air supplying means is compressed and opens when the air supplying means is released to permit the flow of the foamable liquid from the liquid reservoir at atmospheric pressure to the liquid pumping chamber under vacuum;

(f) a valve passage between the ambient air and the air supplying means which closes when the air supplying means is compressed and opens when the air supplying means is released to permit the flow of ambient air to the air supplying means;

(g) a valved passage from the liquid pumping chamber to the mixing chamber which closes when the air supplying means is released and opens when the air supplying means is compressed to permit the flow of the foamable liquid from the liquid pumping chamber to the mixing chamber;

(h) a restricted passage from the air supplying means to the mixing chamber, the restriction being such that it permits the flow of sufficient air to form a foam with the foamable liquid in the mixing chamber, but which also permits sufficient pressurization of the air supplying means upon compression to depress the flexible diaphragm and thereby pressurize the liquid pumping chamber; and

(i) a means for dispensing the foam from the mixing chamber.

4,880,162

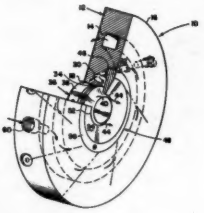
GAS ATOMIZATION NOZZLE FOR METAL POWDER PRODUCTION

Roger A. Howells, Orefield; George H. Stoner, Coopersburg, both of Pa., and Joseph Stockunas, Huntington Beach, Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 15, 1988, Ser. No. 207,096

Int. Cl.[4] B05B *7/10*

U.S. Cl. 239—406 **5 Claims**



1. A nozzle assembly for use in producing particulate metals by a gas atomization process comprising in combination:

a gas nozzle housing having a generally cylindrical shape with an outer wall and an inner wall, said housing including means to direct an atomization from an inlet to a generally circumferential recess disposed in the inner wall of said cylindrical housing;

said means to direct said atomization gas including an annular passage disposed between said inlet and said recess and a plurality of generally tangential flow passages for conducting atomizing gas from said annular passage to said recess, each of said tangential flow passages including means to control the volumetric flow of said gas from said annular passage to said recess; and

a flow direction insert removably disposed within said inner wall of said housing, to in combination with a generally annular shaped flow direction plate removably disposed within said housing and juxtaposed to said flow direction insert and in combination therewith to define means for directing atomization gas to a point of convergence along the center line of said cylindrical housing;

whereby the total volumetric flow of gas through said nozzle can be varied without disassembling the annular flow plate and the flow direction insert.

4,880,163

GAS FEEDING NOZZLE FOR A CHEMICAL VAPOR DEPOSITION APPARATUS

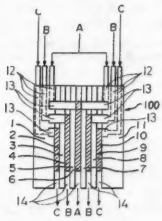
Shigeyoshi Kobayashi, Kawasaki; Susumu Yaba, and Tomoya Takigawa, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 149,084

Claims priority, application Japan, Jan. 27, 1987, 62-15062; Feb. 3, 1987, 62-21683; Feb. 10, 1987, 62-27370; Feb. 10, 1987, 62-27371

Int. Cl.[4] B05B *1/14*

U.S. Cl. 239—422 **24 Claims**



11. A normal pressure chemical vapor deposition apparatus having a gas feeding nozzle which is constituted by a plurality of plate-like bodies, said plate-like bodies being composed of:

at least one partition plate having at least one gas supplying opening and a groove on one side thereof and elongated in the width direction of the partition plate, and

at least one spacer adjacent to said partition plate; said spacer having a plurality of cut portions in the gas-discharging direction, said partition plate and said spacer being stacked alternately to form at least one slit-like gas discharging aperture, wherein in each said slit-like gas discharging aperture, gas is to flow from said gas supplying opening and through said elongated groove in the partition plate, and next through a plurality of cut portions in the spacer adjacent to said partition plate.

4,880,164

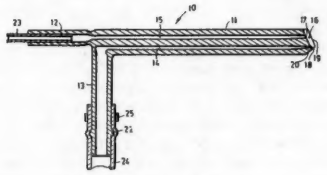
ONE-PIECE HIGH-SOLIDS NEBULIZER

Michael N. A. Noordermeer, 22 Sirrah Street, Geebung, Queensland, 4034, Australia

Filed Jun. 10, 1988, Ser. No. 204,733

Int. Cl.[4] B05B *7/08*

U.S. Cl. 239—423 **4 Claims**



1. A glass spectroscopic nebulizer including:

a tubular glass body having a longitudinal axis and formed with a groove across one end,

a gas passage and a parallel liquid passage formed in the body, both parallel to the longitudinal axis of said body and terminating in outlet orifices opening into the groove, said orifices when formed being constricted in diameter, said passages gradually increasing in diameter away from said orifices to assume full diameter, said liquid orifice being above said gas orifice

a gas inlet to the gas passage for connection to a source of gas under pressure, and

a liquid inlet to the liquid passage for connection to a source of liquid under pressure to be nebulized, and wherein

said groove extends obliquely to form an acute angle with the longitudinal axis of said body and with said passages, the depth and angle of the groove being such as to retain the constricted orifice of gas passage while removing the constriction from the other passage, whereby fluid expelled from the non-constricted liquid passage is entrained and nebulized by gas expelled from the constricted orifice.

4,880,165

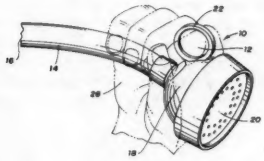
HAND-HELD SPRAY DEVICE

Kevin Fuquay, 11381 Asbury Park, Detroit, Mich. 48227

Filed Mar. 14, 1988, Ser. No. 167,588

Int. Cl.[4] B05B *9/00*

U.S. Cl. 239—525 **1 Claim**



1. In combination with a hand-held spray device for use by an operator in an environment such as a beauty salon for directing the flow of effluent water under presure, the device including a hose having an inlet through which the water flows into the device, a housing connected to the hose and an outlet associated with the housing through which the water is dispersed, the improvement which comprises:

a loop located proximate the housing and defining an opening through which a finger of the operator's hand is inserted so that the positioning and orientation of the device can be controlled by digital pressure exerted on the device through the loop; and

a connection which secures the loop to the device whereby the operator controls positioning and orientation of the outlet by inserting the finger through the loop and grasping the device by the hand to control the direction of effluent water flow from the outlet even when the device is wet and slippery and is subjected to surge forces associated with varying water pressure,

wherein the connection is adjustable whereby the loop can be inclined over a relatively small range of angular displacement relative to the hose to facilitate secure engagement of the loop by either a left-handed or a right-handed operator.

4,880,166

VALVE PISTOL FOR A HIGH PRESSURE CLEANING DEVICE

Wolfgang Suttner, Dunlopstrasse 21, 4800 Bielefeld 11, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,210

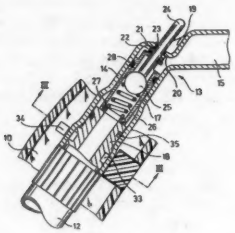
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702586; Jun. 19, 1987, 3720241

Int. Cl.[4] B05B *7/02, 1/30, 1/14*

U.S. Cl. 239—526 **20 Claims**

1. Valve pistol for a high pressure cleaning device with a pistol casing, a valve with a stopper element placed in said pistol casing, a pipe with an obtuse angle bend placed in the pistol casing and having a section used for fluid supply to said valve and a section used for fluid discharge from said valve,

sand a hand lever pivotally supported in said pistol casing and acting on the stopper element of said valve; wherein said pipe, including said pipe sections, is formed of a one piece, continuous angular tube; wherein said valve is disposed within the fluid supply section of said tube; and wherein said fluid supply section within which the valve is disposed is provided with an



opening through which an actuation element for the stopper element of the valve passes; wherein said pipe has an area of decreased cross section bordering said valve; wherein the opening through which said actuation element passes is located in said area of decreased cross section and facing said valve; and wherein a part of said actuation element is located in a free space created by the area of decreased cross section.

4,880,167

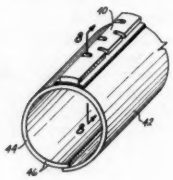
IRRIGATION HOSE WITH LINEAR TURBULENT FLOW EMITTER

John M. Langa, Alpine; Michael J. Boswell, Lakeside, and Kermit R. Littleton, Julian, all of Calif., assignors to James Hardie Irrigation, Inc., Laguna Niguel, Calif.

Continuation-in-part of Ser. No. 100,296, Sep. 23, 1987, abandoned. This application Sep. 13, 1988, Ser. No. 242,706

Int. Cl.[4] B05B *15/00*

U.S. Cl. 239—542 **10 Claims**



1. An irrigation hose, comprising:

(a) a substrate forming a hose body;

(b) an extruded linear strip bonded to said substrate longitudinally thereof;

(c) said strip having spaced turbulent-flow channel sections formed in said strip;

(d) each of said channel sections including a plurality of walls extending partially through said channel section alternately from opposite sides of the channel section;

(e) said walls being hollow; and

(f) said strip and substrate having water inlet and outlet openings formed therein at respectively opposite ends of said channel sections.

4,880,168

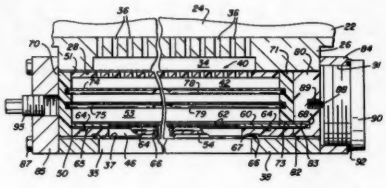
APPARATUS FOR JETTING HIGH VELOCITY LIQUID STREAMS ONTO FIBROUS MATERIALS

Kenneth R. Randall, Jr., Gorham, and Laurent R. Parent, Windham, both of Me., assignors to Honeycomb Systems, Inc., Biddeford, Me.

Filed Jul. 13, 1987, Ser. No. 73,968

Int. Cl.[4] B05B *1/14*

U.S. Cl. 239—553.5 **14 Claims**



1. An apparatus for delivering high velocity liquid jets into a fibrous web for jet entanglement purposes comprising:

a manifold having a body defining an elongated internal manifold chamber and an elongated internal cartridge chamber, and flow distribution means providing flow communication between said manifold chamber and an upper portion of said cartridge chamber,

said manifold body having a bottom wall portion having an elongated slot therein providing communication between a lower portion of said cartridge chamber and the exterior of said manifold body,

an elongated cartridge adapted to be received in said cartridge chamber of said manifold body in a position to be supported by said bottom wall portion thereof and to overlie said slot therein,

said cartridge having a body defining an elongated internal chamber and a bottom wall portion adjacent said bottom wall portion of said manifold body and having an elongated slot therein aligned with said slot in said bottom wall portion of said manifold body,

said cartridge having a top wall portion spaced apart above said bottom wall portion thereof and having a plurality of flow ports therein arranged to receive flow from said flow distribution means and deliver said flow into said cartridge chamber,

said cartridge internal chamber being enclosed within said cartridge and located between said top wall and bottom wall portions of said cartridge,

a nozzle strip adapted to be positioned adjacent said bottom wall of said cartridge and having a plurality of orifices therein aligned with said cartridge slot, and

screen means positioned within said cartridge chamber to extend thereacross at at least one location spaced apart between said top wall portion and said bottom wall portion of said cartridge,

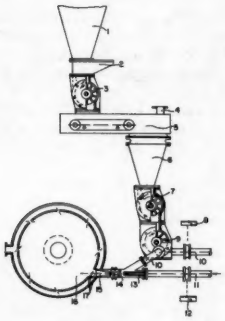
said manifold body, said cartridge, said nozzle strip and said screen means being constructed and arranged so that high pressure liquid delivered to said manifold chamber flows through said flow distribution means to the upper portion of said cartridge from which the liquid flows sequentially through said flow ports in said top wall portion of said cartridge into said cartridge chamber, through said screen means, and through said nozzle strip orifices, the liquid being discharged from said nozzle strip orifices in a plurality of high velocity jets passing through said cartridge slot and said manifold body slot,

said cartridge having an end cap having a clearance slot, and said nozzle strip being of a length such that an end portion thereof extends outwardly from said end cap thorough said clearance slot so that it is accessible for removal of the nozzle strip from said cartridge without the disassembly of said cartridge.

4,880,169
PROCESS AND DEVICE FOR MICRONIZING SOLID MATTER IN JET MILLS

Hans-Günter Zander; Horst Bornefeld, and Bernd-Michael Holle, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,350
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702787
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—5 10 Claims



1. A process for micronizing solid matters in a jet mill comprising introducing the solid matters into a jet mill across an injector and forcibly supplying the solid matters by a pneumatic delivery device to the injector, wherein the forcible introduction of the solid matters is monitored across a pressure measurement at an installation in the jet mill, wherein the pressure measurement occurs in measuring cycles and wherein a blocking of the installation is avoided by a pressure impulse between the measuring cycles.

4,880,170
PROCESS FOR PRODUCING FINE COPPER POWDER WITH ENHANCED SINTERABILITY

Preston B. Kemp, Jr., Troy, N.Y., and Walter A. Johnson, Houghton, Mich., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 292,791
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—5 2 Claims

1. A process for producing copper powder with enhanced sinterability, said process comprising fluid energy milling dendritic copper powder particles having a mean particle size of no greater than about 25 micrometers in diameter to produce a deagglomerated cold-worked powder wherein the particles are essentially equiaxed in shape and are of a mean particle size of no greater than about 7 micrometers in diameter.

4,880,171
APPARATUS FOR THE PRODUCTION OF PULP SUSPENSIONS

Roderick D. Garrett, P.O. Box 2996, San Rafael, Calif. 94912

Filed Aug. 19, 1988, Ser. No. 233,768
Int. Cl.[4] B02C *23/36*
U.S. Cl. 241—46.11 4 Claims

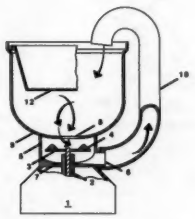
1. A pulping and mixing apparatus comprising:

an open vessel having side walls and a bottom wall, with an aperture therein, said aperture of a configuration which controls the transfer of centrifugal hydraulic force,

a chamber adjacent to said aperture having a wall and a floor, said floor being sloped as a volute so as to take advantage of the said centrifugal force, conserved in said chamber, by trajecting it to an outlet port placed in the chamber wall so as to receive the directed hydraulic force,

a tube communicating from said outlet port to said vessel,

a shaft member generally vertically disposed into said chamber through said floor so as to avoid mechanisms in said vessel,



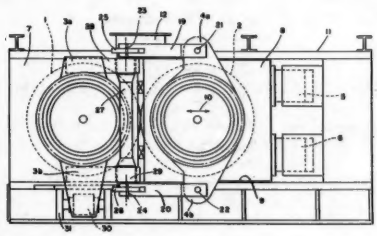
a rotor plate attached to the top of said shaft member having a periphery spaced slightly from the said chamber wall, said rotor plate having a plurality of vanes there on, said chamber containing said rotor plate and vanes,

a means for rotating said shaft member.

4,880,172
ROLLER MILL

Otto Heinemann, Ennigerloh; Heinz-Dieter Baldus, Ahlen, and Norbert Schröder, Oelde, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Feb. 12, 1988, Ser. No. 155,577
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707015
Int. Cl.[4] B02C *4/02, 4/32*
U.S. Cl. 241—101.2 4 Claims



1. In a roller mill having a frame, a fixed roller mounted on said frame, a floating roller mounted on said frame for movements toward and away from said fixed roller, means for urging said floating roller into engagement with said fixed roller under high contact pressure, drive gearing contained in casings and coupled to the respective rollers for driving said rollers in opposite directions, and means for absorbing torque occuring between said gearing and said frame, the improvement wherein said torque absorbing means comprises first support means directly connecting said casings to one another for taking up contrarotating principal torque, and second support means connecting one of said casings to said frame for taking up differential torque, said first support means having a flexible member for accommodating relative movement between said rollers.

4,880,173

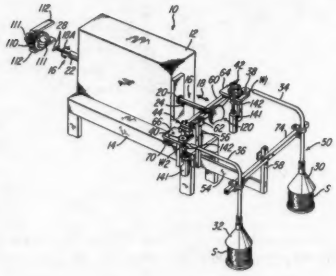
WIRE SUPPLY METHOD AND APPARATUS

Richard N. Lachey, New Carlisle, Ohio, assignor to Globe Products Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 60,040, Jun. 9, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,813

Int. Cl.[4] B65H *59/22;* **H01F** *41/04*

U.S. Cl. 242—1.1 R **36 Claims**



1. In a method of winding a stator using a stator winding machine of the type having means at its forward end for supporting an unwound stator core, a winding shuttle having a wire inlet at its rearward end and a wire outlet at its forward end, means for reciprocating said shuttle in forward and reverse directions along a predetermined axis and oscillating said shuttle about said predetermined axis to draw a wire from a source of wire under tension into said wire inlet and out of said wire outlet to wind a coil around surfaces of a stator core surrounding said predetermined axis, the improved method comprising the steps of providing a member having a smooth wire-engaging surface that moves relative to the portion of the wire about to enter said inlet as said shuttle reciprocates so that when said shuttle approaches the end of each of its forward strokes said surface frictionally engages said wire portion to restrain forward movement of said wire relative to said shuttle at the end of each forward stroke of said shuttle and so that said surface is not engaged with said wire during other parts of the reciprocatory movements of said shuttle.

4,880,174

PACKAGE SUPPORT APPARATUS FOR AUTOMATIC WINDER

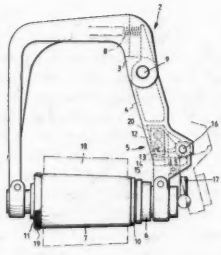
Shuzo Kawamura, Joyo, and Yukio Hirai, Ohtsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 8, 1988, Ser. No. 216,846

Claims priority, application Japan, Jul. 10, 1987, 62-172352

Int. Cl.[4] B65H *49/26, 54/42, 54/553*

U.S. Cl. 242—18 DD **18 Claims**



1. In a textile machine for winding yarn about a take-up tube of a package, the textile machine having a brake device for braking the rotation of said take-up tube, a package support device comprising:

a cradle base;

an opening/closing arm supporting the brake device and rockably connected to the cradle base; and

a lock mechanism provided between the opening/closing arm and the cradle base for regulating the rocking movement of the opening/closing arm.

4,880,175

TENSION SETTING AND CONTROLLING METHOD AND APPARATUS IN AN AUTOMATIC WINDER

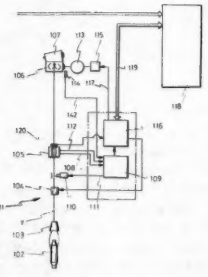
Tosio Yamauchi, Kyoto; Shoichi Tone, Kyoto, and Yutaka Ueda, Nara, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 11, 1988, Ser. No. 180,370

Claims priority, application Japan, Apr. 14, 1987, 62-091124; Jun. 10, 1987, 62-144339; Jun. 13, 1987, 62-147397; Jul. 10, 1987, 62-173467

Int. Cl.[4] B65H *54/20, 59/00, 59/10, 59/38*

U.S. Cl. 242—35.5 R **20 Claims**



1. A tension control method in an automatic winder having a winding unit for performing a winding operation, the method comprising the steps of:

generating a constant length pulse signal with a constant length pulse generator associated with the automatic winder,

determining the amount of yarn wound on a yarn package on the basis of the constant length pulse signal generated by the constant length pulse generator, and

applying a designated tension corresponding to the determined amount of yarn to a travelling yarn through a variable tenser associated with the winding unit.

4,880,176

YARN END FINDING DEVICE

Isamu Matsui, Kyoto; Hiroshi Uchida, Oumihachiman; Hirao Otojima, Shiga, and Yoshihiro Kino, Nagaokakyo, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

PCT No. PCT/JP85/00574, § 371 Date Jun. 5, 1987, § 102(e) Date Jun. 5, 1987, PCT Pub. No. WO87/02342, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 15, 1985, Ser. No. 66,419

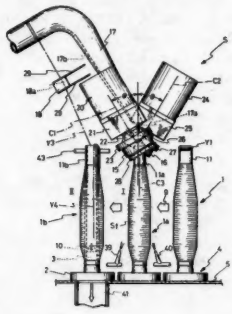
Int. Cl.[4] B65H *54/22, 67/08*

U.S. Cl. 242—35.6 E **23 Claims**

11. A yarn end releasing device, operable with a drive device, for releasing a yarn end from a layer of yarn wound about the axis of a spinning bobbin, said yarn end releasing device comprising:

at least one rotatable roller rotatable roller rotatably drivable about a roller axis by the drive device, said at least

one rotatable roller having an outer peripheral surface abutting said layer of yarn;



wherein said roller axis is provided at an angle with respect to the axis of the spinning bobbin and also with respect to the directions perpendicular to the axis of the spinning bobbin.

4,880,177

YARN WITHDRAWAL APPARATUS

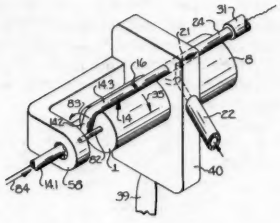
Erich Lenk, Remscheid, and Albert Stitz, Kürten, both of Fed. Rep. of Germany, assignors to Barmag, AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 218,089, Jul. 12, 1988, which is a continuation-in-part of Ser. No. 38,334, Apr. 14, 1987, Pat. No. 4,817,880, which is a continuation-in-part of Ser. No. 8,490, Jan. 29, 1987, Pat. No. 4,784,344. This application Nov. 2, 1988, Ser. No. 266,472

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737960; Jun. 9, 1988, 3819677

Int. Cl.[4] B65H *51/20*

U.S. Cl. 242—47.01 **16 Claims**



1. In a yarn processing apparatus having means for continuously processing and advancing a yarn along a predetermined path of travel, the combination therewith of an auxiliary yarn withdrawal means for continuously withdrawing the advancing yarn from said predetermined path of travel to facilitate yarn threadup and the like, said yarn withdrawal means comprising

a support structure,

yarn advancing means mounted to said support structure and comprising at least one rotatable roll,

drive means mounted to said support structure for rotating said one roll at a predetermined rotational speed,

a yarn delivery tube including a yarn outlet opening,

a yarn suction tube including a yarn inlet opening, said inlet opening being disposed to open along a direction which is parallel to the axial direction of said one roll,

suction means for drawing air into said suction tube through said inlet opening, and

means mounting said yarn delivery tube and said yarn suction tube to said support structure so as to permit relative rotation of said yarn outlet opening and said yarn inlet opening in the circumferential direction about said one roll and between (a) a yarn catching position wherein said yarn outlet opening and said yarn inlet opening are disposed immediately adjacent to each other and aligned along a direction substantially parallel to the axial direction of said one roll, and (b) a drawing-off position, and whereby such relative rotation causes a yarn passing from said yarn delivery tube to said yarn suction tube to be at least partially looped about said one roll.

4,880,178

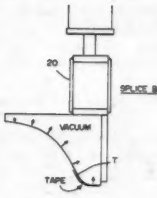
ROLL UNWIND BUTT SPLICER

Stephen L. Goulette, Newark, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 4, 1988, Ser. No. 228,146

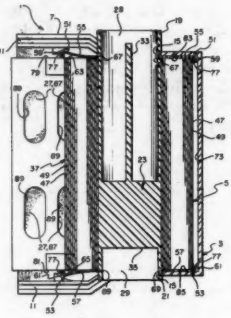
Int. Cl.[4] B65H *19/14, 19/18;* **B31F** *05/00*

U.S. Cl. 242—58.1 **7 Claims**



1. An apparatus for the joining together of the tail end of an expiring first web being dispensed from a wound roll which is supported on a first reel with the lead end of a new second web of a wound roll which is supported on a second reel; comprising: means for rotatably supporting said first reel and said second reel; means for attaching an adhesive tape to the lead end of said second web and maintaining said lead end and adherent tape in a standby position; said apparatus including vertical support columns, said means for attaching said adhesive tape to said second tape including a splicing bar having a vacuum selectively applied thereto for retaining said tape in surface contact therewith, said splicing bar being mounted to be vertically displaceable along said columns; a preparation table being pivotably mounted relative to said columns and receiving the lead end of said second web, said splicing bar adhesively contacting said tape with said second web; means for sensing the impending expiration of said first web being unwound from said first reel; means for causing the tape on said second web to adhesively contact said first web proximate the tail end thereof in response to a signal from said means sensing the impending expiration of said first web and to form a connection between said first and second webs; and means for severing the selvage end of said first web immediately upstream of the region of contact of said first web with said adhesive tape so as to produce an abutting joint between said webs; said means for attaching said adhesive tape to the lead end of said second tape preparing the lead end of a further web for subsequent joining to the tail end of said second web upon impending expiration of said second web so as to provide a continual feed of abuttingly joined webs.

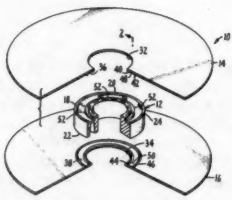
4,880,179
FILM CASSETTE
David E. Beach, Stow, Vt., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 12, 1989, Ser. No. 296,475
Int. Cl.[4] G03B *17/26*
U.S. Cl. 242—71.1 **4 Claims**



1. An improved film cassette wherein (a) a filmstrip is coiled about a rotatable film spool and includes a leader portion which extends along a film passage slit opening to the outside of the cassette shell, and (b) a pile-like material consisting of short close flexible fibers is secured to said cassette shell along said film passage slit to prevent ambient light substantially from entering the slit, and wherein the improvement comprises:

said leader portion having at least one hole adapted to receive a sufficient number of said fibers to allow the fibers to releasably engage the leader portion to prevent its casual creep rearward in said film passage slit to the inside of said cassette shell.

4,880,180
TAPE REEL
Henry Adair, Mission Viejo, Calif., assignor to Memorex Corporation, Irvine, Calif.
Filed Jul. 25, 1988, Ser. No. 223,945
Int. Cl.[4] B65H *75/18*
U.S. Cl. 242—71.8 **11 Claims**



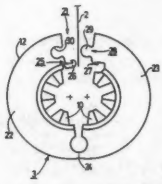
1. A reel for magnetic recording tape comprising:

a hub of cylindrical configuration having an outside circumference and parallel end surfaces, an outer circumferential portion of each end surface defining attachment areas;

a pair of parallel spaced apart, disk shaped flanges each having an opening therethrough, an inner circumferential portion of said flange thereof defining a contact surface complementary to the attachment area of said hub, said contact surfaces each having a pair of radially spaced circumferential ridges defining an annular region therebetween, said ridges being in contact with said attachment areas, said ridges being thin relative to the thickness of said flanges defining energy directors allowing ultrasonic welding of said flanges to said hub, the entire circumference of each ridge being welded to said attachment area to encapsulate said annular regions; and

adhesive means within said annular regions to permanently attach said flanges to said hub, said adhesive means being contained within said annular regions to prevent said adhesive means from migrating radially outwardly toward said flanges and tape that may be wound onto said hub between said flanges.

4,880,181
REEL-HUB FOR A TAPE
Walter Drahanowsky, Vienna, Australia, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 2, 1988, Ser. No. 202,158
Claims priority, application Austria, Jun. 3, 1987, 1409/87
Int. Cl.[4] B65H *75/28*
U.S. Cl. 242—74 **18 Claims**



1. In a reel hub for a tape having an annular hub with an outer circumferential surface for winding a tape thereon and an inner portion defining an opening and having an arrangement of driving elements, said annular hub defining a hub axis transverse to the plane of the hub and having two hub portions separated along a substantially radial direction at a first circumferential hub location and, at a second circumferential hub location substantially diametrically opposite said first circumferential location, said hub being partially separated in a direction extending from said inner portion towards said outer circumferential surface forming an elastically deformable bridge connecting said two hub portions, at said first circumferential location said hub portions having opposing faces comprising tape clamping means for clamping an end portion of a tape therebetween and locking means for locking said two hub portions together in a direction transverse to said hub axis, wherein the improvement comprises:

said hub at the area of said first circumferential location comprising axial aligning means for axially aligning said two hub portions.

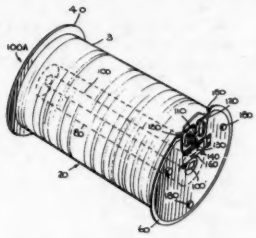
4,880,182
CABLE REEL
Stanley Gelfman, 491 High Cliffe La., Tarrytown, N.Y. 10591
Continuation-in-part of Ser. No. 173,288, Mar. 25, 1988, Pat. No. 4,796,830. This application Jan. 6, 1988, Ser. No. 294,184
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[4] B65H *75/12*
U.S. Cl. 242—117 **42 Claims**

1. A cable reel comprising:

a first cylindrical member about which cable can be wound having a longitudinal axis and a hollow interior;

first and second flanges disposed at opposite ends of said cylindrical member substantially at right angles to the longitudinal axis of said cylindrical member, one of said flanges having an outside surface having at least one opening arranged adjacent the periphery of said one flange through which the cable can be traversed and a second opening in the surface disposed adjacent the center of said

one flange and opening into the hollow interior of the cylindrical member, said hollow interior adapted to receive ends of the cable wound on said cylindrical member,



at least one end being received through the second opening, and further comprising means disposed on the outside surface for protecting the cable extending between the first opening and the second opening.

4,880,183

TUBE WITH YARN CATCH PLACE

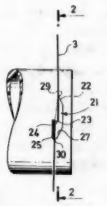
Milan Kubata; Jiri Soukup, and Jiri Trhlik, all of Usti nad Orlici, Czechoslovakia, assignors to Flitex, Liberec, Czechoslovakia

Filed Aug. 31, 1988, Ser. No. 239,088

Claims priority, application Czechoslovakia, Sep. 1, 1987, 6350-87

Int. Cl.[4] B65H *75/28*

U.S. Cl. 242—125.1 **5 Claims**



1. An improved tube for winding yarn on open-end spinning machines, provided near at least one of its ends with at least one catch place for yarn, the improvement comprising

the yarn catch place having a catch point oriented in the direction of rotation of the tube and formed as a part of the tube, and

the yarn catch place being radially oriented extended hole having two most distant circumferential points connected by two side wall, said catch point extending from one of said side walls such that a straight line connecting the two most distant circumferential points of said hole passes under the catch point;

the side wall opposite said catch point being provided with slanting lead-in edges at said most distant circumferential points.

4,880,184

YARN PACKAGE SUPPORT FOR CREEL

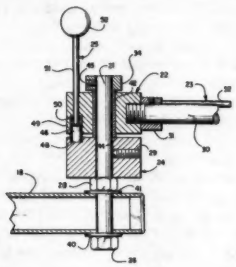
Mitchell A. Crow, 2279 Kerr Rd., NW., Dalston, Ga. 30720

Filed Sep. 19, 1988, Ser. No. 246,401

Int. Cl.[4] B65H *49/04*

U.S. Cl. 242—130 **11 Claims**

1. A yarn package support including a generally vertically extending post, a latch block received on said post and selectively fixed with respect to said post, a support block juxtaposed over said latch block and selectively pivotal about said post, said support block defining a central opening for receiving said post therein, and a bearing means within said opening in said support block for journaling said support block on said post, a cone holder carried by said support block and extending generally horizontally therefrom and pivotal therewith, and latch means carried by said support block for selectively latching said support block to said latch block for selectively preventing pivotal motion of said support block with respect to



said latch block, said bearing means comprising a sleeve extending beyond said support block towards said latch block so that the weight of said support block is carried by said sleeve, a set screw threadedly engaged with said latch block and selectively engageable with said post, said latch means including a latch member slidably received in an opening in said support block, the lower end of said latch member being receivable within a notch in said latch block for positively latching said support block with respect to said latch block, and a handle for selectively releasing said latch means.

4,880,185

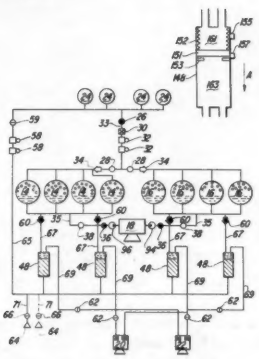
LOW PRESSURE REACTION CONTROL PROPULSION SYSTEM FOR A SPACECRAFT

Steven L. Apfel, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 830,306, Feb. 18, 1986. This application Sep. 21, 1988, Ser. No. 248,266

Int. Cl.[4] B64G *1/40*

U.S. Cl. 244—135 B **26 Claims**



1. A satellite propulsion system adapted to supply liquid propellant to a first thruster at a first flow rate and to a second thruster at a second higher flow rate, comprising:

a gas pressure source,

a propellant tank for holding said propellant,
a bellows tank,
a collapsible bellows in said bellows tank which divides said bellow tank into a gas side and a propellant side, the relative volume of said gas side and said propellant side varying as said bellows collapses and expands,
a first conduit communicating said propellant tank with said propellant side of said bellows tank,
a first valve means in said first conduit for controlling propellant flow in said first conduit,
a second conduit communicating said gas pressure source with said gas side of said bellows tank,
a second valve means in said second conduit,
a third conduit communicating said first thruster with said propellant side of said bellows tank,
a third valve means in said third conduit for controlling the flow of propellant to said first thruster,
a fourth conduit communicating said propellant tank with said second thruster,
a fourth valve means in said fourth conduit for controlling the flow of propellant to said second thruster,
a propellant pump in said fourth conduit for pressurizing the propellant flowing to said second thruster,
a fifth conduit communicating to said gas side of said bellows tank and for venting said gas side of said bellows, and
a fifth valve means in said fifth conduit wherein, when said propellant side of said bellows is filled with propellant, said gas side of said bellows may be pressurized, thereby pressurizing said propellant which is transmitted to said first thruster when said third valve means is opened, and wherein said propellant side of said bellows may be refilled with propellant by opening said fifth valve means and closing said second valve means, thereby venting said gas side of said bellows tank and enabling said propellant to refill said propellant side of said bellows tank.

4,880,186

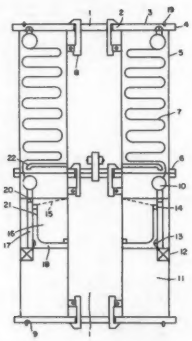
PREFABRICATED SPACE STATION

John Mecca, 110 Whittier Dr., San Remo, N.Y. 11754

Continuation-in-part of Ser. No. 804,288, Dec. 5, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 109,726

Int. Cl.[4] B64G *1/10*

U.S. Cl. 244—159 **3 Claims**



1. A prefabricated space station comprising first and second members connected by a plurality of latches, a cylindrically formed folded flexible double walled body located within said first member and having an exposed annular edge extending into said second member, means within said second member upon actuation for dispensing foam evenly into the annular edge of said flexible body for causing the two walls of said body to spread apart thereby causing said body to expand and permit the deployment of said body fully expanded.

4,880,187

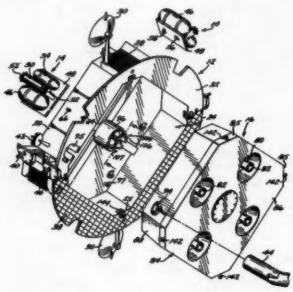
MULTIPURPOSE MODULAR SPACECRAFT

Kenneth H. Rourke, Palos Verdes Estates, and Raymond J. Hart, Villa Park, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 819,337, Jan. 16, 1986, abandoned, which is a continuation of Ser. No. 609,157, May 10, 1984, abandoned. This application Nov. 17, 1988, Ser. No. 273,630

Int. Cl.[4] B64G *1/40*

U.S. Cl. 244—172 **33 Claims**



33. A multipurpose modular spacecraft, comprising:
a short range space vehicle having flight control means for controlling the vehicle during flight in space;
a plurality of modular propulsion sets removably mounted on the vehicle in a respective plurality of predetermined positions accessible from the exterior of the vehicle to provide propulsion capacity for relatively short-range missions of the vehicle;
a propulsion module removably mounted on the vehicle to provide propulsion capacity for relatively long-range missions of the vehicle;
wherein the plurality of modular propulsion sets and the propulsion module can be replaced quickly and easily in space to refuel the modular spacecraft without requiring any transfer of propellants or fluids in the space environment.

4,880,188

JOINT FOR UNFOLDING PANELS OF A SOLAR COLLECTOR

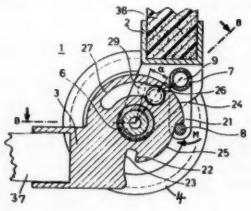
Martin Roth, Taufkirchen, and Helmut Kiendl, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,812

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804202

Int. Cl.[4] B64G *1/46*

U.S. Cl. 244—173 **12 Claims**



1. A joint for interconnecting in an unfoldable manner panels (36, 37) of a solar collector having at least one outermost panel

(36) and at least one inner panel (37), comprising a first joint section (2 rigidly connected to said outermost panel, a second joint section rigidly connected to said inner panel, journal means including a journal shaft (30) for journalling said first and second joint sections to each other for permitting an unfolding movement of the first and second joint sections relative to each other, a cable pulley (4) operatively mounted on said journal shaft, first spring biased locking means (7) and second spring biased locking means (14) mounted in said first joint section (2) for arresting said first and second joint sections, said second joint section (3) having a plurality of stop means (21, 22, 23, 26) arranged for cooperation with the respective locking means mounted in said first joint section (2) for holding said first locking means in a formlocking manner in the fully unfolded state and for blocking said second locking means in the unfolding direction in a partially unfolded state, said second joint section (3) having means (28) for keeping said second locking means (14) in an ineffective position until said outer panel (36) has been tilted into a partially unfolded state, said cable pulley (4) having a stop surface (35) for cooperation with said second locking means when said outer panel is in a partially unfolded state, said cable pulley (4) further having recess means (29) for receiving said second locking means (14) in a formlocking manner during transition from a partially unfolded state into a fully unfolded state and in the fully unfolded state, said cable pulley (4) having such a diameter that the full unfolding of said inner panel through 180° causes said cable pulley (4) to move through angular range (x)that corresponds to an angular tilting movement of said outer panel plus a lead angle (α), whereby panel rebounding is prevented.

4,880,189

DEVICE FOR CLOSING AND OPENING IN THE LEADING EDGE OF A WING

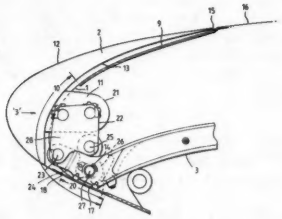
Roger A. Day, Bristol, England, assignor to British Aerospace Public Limited Company, London, England

Filed Sep. 4, 1988, Ser. No. 190,017

Claims priority, application United Kingdom, May 6, 1987, 8710735

Int. Cl.[4] B64C *3/50*

U.S. Cl. 244—214 **3 Claims**



1. A wing leading edge arrangement for aircraft in which a slat is provided forwardly of a fixed leading edge portion and movable between a stowed configuration in which it lies closely adjacent the fixed leading edge portion and a deployed configuration in which it is spaced from the wing to define a slot, said arrangement including:

slat attachment means for connecting said slat to two or more support tracks slidably mounted with respect to the fixed wing portion to define said movement;

aperture means in said fixed leading edge portion to accommodate said slat attachment means when said slat is in its stowed configuration;

aperture closing means pivotally located to said fixed leading edge portion adjacent said aperture and movable between a folded position when the slat is in its stowed configuration and an aperture closing position when said slat is in its deployed configuration;

and actuating means interconnecting said aperture closing means and said fixed leading edge portion for causing said aperture closing means to move between its stowed and deployed positions;

said aperture closing means comprising a shutter whose surface area is at least equivalent to the included area of said aperture and configured such that when closed it conforms substantially to the inner surface configuration of said fixed leading edge portion and hinge means transversely connecting said shutter at or adjacent its upper boundary to said fixed leading edge portion such that it is constrained to move from its stowed to deployed positions in a plane generally parallel to the movement of its associated slat supporting track;

said shutter comprising a first panel portion including first hinge means for hingedly connecting said first panel portion at or adjacent its upper boundary to said fixed leading edge portion and second hinge means positions adjacent its lower boundary for hingedly engaging a second panel portion, said first and second panel portions combining to close off said aperture when the slat is deployed but which are foldable with respect to each other when the slat assumes its stored configuration.

4,880,190

LOCOMOTIVE CURVE TRACKING SYSTEM

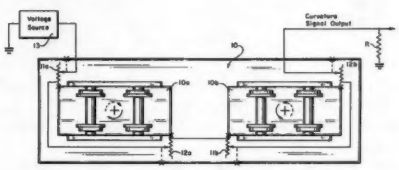
Robert J. Austill, Santa Clara, and Joseph M. Lambert, Lincoln, both of Calif., assignors to Southern Pacific Transportation Co., San Francisco, Calif.

Division of Ser. No. 940,599, Dec. 11, 1986, Pat. No. 4,793,577.

This application Nov. 18, 1988, Ser. No. 273,345

Int. Cl.[4] B61L *25/00*

U.S. Cl. 246—107 **5 Claims**



1. Apparatus for continually producing signals proportional in amplitude to an angle between the longitudinal centerline of a railroad vehicle and the longitudinal centerline of one truck of said vehicle comprised of a linear motion transducer mechanically affixed between one corner of said truck and the nearest side of said vehicle, said linear transducer being oriented perpendicular to said nearest side of said vehicle when the axis of said truck is parallel to the axis of said vehicle, whereby an output signal is produced that is a function of displacement of said truck corner and said side of said vehicle as a measurement of said angle, and including a second linear motion transducer mechanically affixed between a second corner of said truck diagonally opposite said one corner and the nearest side of said vehicle to said second corner, said second transducer being oriented perpendicular to said nearest side thereof when the axis of said truck is parallel to the axis of said vehicle, whereby a second output signal is produced that is a function of displacement of said second corner of said truck and the nearest side of said second corner, and means for electrically connecting said transducers to algebraically add said output signals for increased sensitivity to any pivotal motion of said truck with respect to said vehicle.

4,880,191

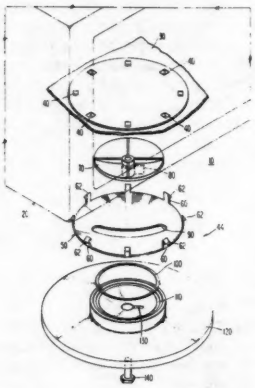
MOUNTING ARRANGEMENT FOR DISPLAY TERMINAL

Ralph J. Lake, Jr., Somerville, N.J., assignor to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 627,855, Jul. 5, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 814,536

Int. Cl.[4] A40G 29/00

U.S. Cl. 248—371 12 Claims



1. A display terminal comprising:

a cabinet having a base, a plurality of apertures in said base; and

means for supporting said cabinet, said support means including a plurality of flexible tabs which are engageable with said plurality of apertures to couple said cabinet to said support means, said support means further including

pedestal means for supporting said display terminal on a planar surface, said pedestal means including a swivel bottom having a first recess therein, said first recess having a surface of curvature defined by a first radius,

a swivel top having a second recess therein, said second recess having a surface of curvature defined by a second radius, said swivel top including said plurality of flexible tabs, a first end of each of said flexible tabs connected to said swivel top, the distal end of each of said flexible tabs projecting upward from said swivel top,

a curved slot provided adjacent the surface of curvature of said second recess, a keyway provided adjacent the surface of curvature of said first recess,

a disk, said disk including a key projecting downward from its lower surface, said disk positioned in contact with said second recess with the key passing through said curved slot and seated in said keyway, and

a bolt passing through said disk, said key, said curved slot and said keyway, a nut engaging the threaded end of said bolt, the head of said bolt having a diameter too large to pass through said keyway.

4,880,192

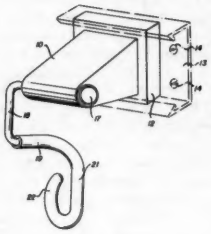
HANDLED TOOL SUSPENSION DEVICE

Hans Vom Braucke, Vlotho; Manfred Vom Braucke, Telgenbrink, and Dieter Westerwelle, Markusstrasse, all of Fed. Rep. of Germany, assignors to Bielefelder Kuchenmaschinen- und Transportgerate-Fabrik Vom Braucke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,270

Int. Cl.[4] A46B 17/02

U.S. Cl. 248—110 8 Claims



1. A device for suspending handled tools such as brooms, spades and rakes, comprising:

hook means; and

mounting means for said hook means,

said mounting means defining a pivot axis for said hook means, said pivot axis extending substantially horizontally, said hook means having:

a front elevation which is substantially S-shaped and having a mounting shaft portion located in said mounting means so as to be pivotable about said horizontal axis,

a linear portion extending substantially at a right angle from said mounting shaft portion in a generally downward direction,

another portion extending from said linear portion,

said another portion being substantially C-shaped, and

a hook portion extending from said another portion, wherein said another portion is curved in three dimensions and has a first leg being in a concaved curvature, an intermediate leg being straight, and a third leg being in a convexed curvature, and wherein said hook portion is directed generally inwardly.

4,880,193

LESS THAN 360 DEGREE LAMP SWIVEL

Jerome Warshawsky, 1322 Everitt Pl., Hewlett Harbor, N.Y. 11557

Continuation of Ser. No. 930,986, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 735,526, May 20, 1985, abandoned. This application Aug. 5, 1987, Ser. No. 83,012

Int. Cl.[4] F16L 3/00

U.S. Cl. 248—122 7 Claims

1. A swivel assembly for a lamp comprising:

(a) a first tubular swivel means matable with a second tubular swivel means, said first swivel means and said second swivel means rotatable with respect to each other about a common axis, said first tubular swivel means including,

(i) a first outer diameter portion,

(ii) a second outer diameter portion extending from said first outer diameter portion,

(iii) a third outer diameter portion defining a groove in said second outer diameter portion;

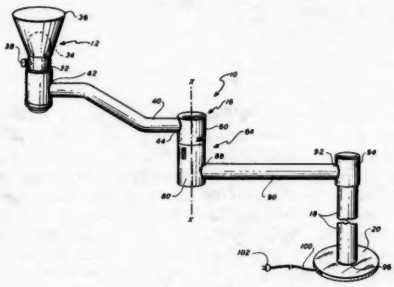
(b) said first outer diameter portion terminating in a first shoulder and stepping down to said second outer diameter portion, said second outer diameter portion being smooth walled and extending from said shoulder to a stop means, said second outer diameter portion interrupted by said third outer diameter defining a groove in said second

diameter portion, said stop means defining a partial arcuate extension of said second outer diameter portion;

(c) said second tubular swivel means including,

(i) a fourth outer diameter portion, the diameter of which corresponds to the diameter of said first outer diameter portion,

(ii) a first inner diameter portion adapted to matably receive said second outer diameter portion and said third outer diameter portion and said stop means of said first tubular swivel means, said fourth outer diameter portion terminating in a second shoulder, said first inner diameter portion extending from said second shoulder and under said fourth outer diameter defining a reception cavity in said second tubular swivel means for receiving said second outer diameter portion and said third outer diameter portion and said stop means; and,



(d) swage means located in said fourth outer diameter portion of said second tubular swivel means and positioned circumferentially for repositioning a circumferential portion of said fourth outer diameter portion and said first inner diameter portion to a first variable outer arcuate portion and a first variable inner arcuate portion, said first variable inner arcuate portion extending to a level between said second outer diameter portion and said third outer diameter portion for capturing and retaining said first tubular swivel means in mated condition in said second tubular swivel means and for preventing sliding separation of said first and second swivel means without interfering with the rotational relationship between said first tubular swivel means and said second tubular swivel means.

4,880,194

APPARATUS AND METHOD FOR SUPPORTING ARTICLES

John Geise, 4433 Kill Rd., Delphos, Ohio 45833, and Lynn Niese, 4680 Alabama Ave., Navarre, Ohio 44662

Filed Jul. 21, 1987, Ser. No. 76,203

Int. Cl.[4] F16M *11/38*

U.S. Cl. 248—166 **2 Claims**

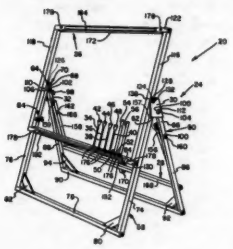
1. A multiposition apparatus for supporting articles such as automotive body parts, panels, doors, appliance parts, and the like for servicing, comprising:

a base member, having a bottom portion and a top portion, adapted to be selectively disposed in one of a storage position and a functional position, said base member including: spacedapart generally vertically disposed frame members including a first frame member and a second frame member each of said first frame member and said second frame member having at least one generally horizontally disposed bottom element and a plurality of generally vertically disposed elements having opposite upper ends and bottom ends, said bottom ends being connected to respective opposite ends of said bottom elements whereby said vertical elements are held in spaced relation by said bottom elements, upper portions of said upper ends of one of said first frame member and said second frame member being angularly offset with respect to said upper ends of the other one of said first frame member and said second frame member whereby said base member is selectively moveable between a storage position and a functional position in that said top portions of said first frame member and said second frame member converge together and limit movement of one of said first frame member and said second frame member away from the other of said first frame member and said second frame member;

plate means secured to said upper ends of one of said first frame member and said second frame member;

means for pivotally connecting said plate means to the upper end of the other of said first frame member and second frame member;

support means mounted on said base member and adapted for selective movement between a substantially horizontal position and a substantially vertical position, said support means comprising a first pivotal member and a second pivotal member whereby one of said first pivotal member and said second pivotal member braces the other of said



first pivotal member amd said second pivotal member in said substantially horizontal position;

means for pivotally connecting said plate means to one of said first pivotal member and said second pivotal member whereby said first pivotal member and said second pivotal member is selectively pivotal between said substantially horizontal position and substantially vertical position; and

means for selectively securing said support means in one of said substantially vertical position, and substantially horizontal position, and said securing means comprising a bracket means and a latch means one of said bracket means and said latch means being secured to one of said first frame member and said second frame member and the other of said bracket means and said latch means being secured to the one other of said first frame member and said second frame member, said latch means comprising a first latch member and a second latch member, one of said first latch member and said second latch member being secured to one of said base member and said support means and the other one of said first latch member and said second latch member being secured to the other one of said base member and said support means.

4,880,195

BANNER SUPPORT

Roger M. Lepley, Kalamazoo, Mich., assignor to Kalamazoo Banner Works, Inc., Kalamazoo, Mich.

Filed Dec. 9, 1988, Ser. No. 283,062

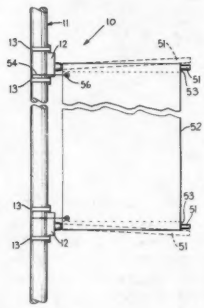
Int. Cl.[4] A47B *96/00*

U.S. Cl. 248—219.4 **11 Claims**

1. A banner support assembly adapted to be mounted on a supporting member for purposes of engaging and holding taut an elongated banner having sleeve-like openings in the opposite longitudinal ends thereof, said banner support assembly comprising:

first and second housing members each having an elongated body with an elongated T-shape channel opening outwardly of said body along a front face and at at least one end thereof, said T-shaped channel having an abutment means at the other end of said channel, said first and second housing members being adapted to be mounted a prescribed distance apart on said supporting member and with each longitudinal axis of each T-shaped channel being axially aligned and with said openings in said at least one end facing in the same direction, each of said T-shaped channels being defined by straight inwardly facing walls which are each oriented parallel to said longitudinal axis;

first and second holder members each having a generally T-shaped cross section conformed to said cross sectional shape of said T-shaped channels and being adapted to be received in a respective one of said T-shaped channels through said openings in said at least one end thereof, each of said holder members having at least first and second ends with a selected one thereof adapted to rest against a respective one of said abutment members, said T-shaped cross section of said holder members being defined by outwardly facing surfaces extending parallel to said straight inwardly facing walls of said T-shaped channels;



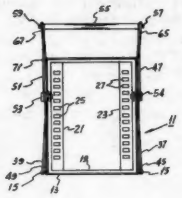
an elongated, elastically flexible wand fixedly secured to each holder member and having a longitudinal axis thereof oriented to extend at an angle to said longitudinal axis of said T-shaped channel when one of said first and second ends of said holder member abuts said abutment member, each of said wands extending away from a part of a respective one of said T-shaped holder members that extends through said opening in said front face of said housing member, said longitudinal axis of each wand being oriented on a respective holder member to lie within a common plane with each other, said first holder member being received in a T-shaped channel in said first housing member with said first end thereof abutted against an abutment member in said first housing member, said second holder member being received in a T-shaped channel in said second housing member with at least one of said first and second ends thereof abutted against an abutment member in said second housing member, said wands each being adapted to be received into a selected one of the two sleeve-like openings in said banner, the length of said banner being generally equal to a spacing between said wands whereat said wands are joined to said holder members when said holder members both abut said abutment members.

4,880,196

APPARATUS FOR MOUNTING MARINE ELECTRONIC EQUIPMENT

John E. Eichenlaub, 9426 Beverly La., Sanibel Island, Fla. 33957

Filed Jun. 1, 1987, Ser. No. 56,157
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—293 **11 Claims**



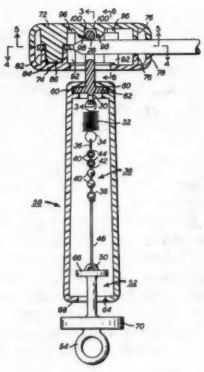
1. A support structure for equipment comprising: an open frame; a back pivotally connected at one edge to one edge of said open frame; a pair of articulated links pivotably connected at one end each to said open frame adjacent an edge opposite said one edge of said open frame and on opposite sides of said open frame; a pair of other links pivotably connected to another edge of said back opposite said one edge and releasably connected to an elongate member pivotally connected to and extending between the free ends of said articulate links; a pair of elongate links pivotably connected each at one end to said open frame on opposite sides thereof and at locations adjacent said one edge, the free end of each elongate link being releasably connectable to one of said articulated inks and to said elongate member; and means for connecting said back to another support structure in such a way that said open frame can support said equipment.

4,880,197

MOUNTING MEANS FOR A TOY MOBILE

Randall Wsyzynski, West Seneca, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 101,988, Sep. 29, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 259,476
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—324 **3 Claims**



1. A mobile comprising a supporting member, a suspended member and mounting means connecting said suspended mem-

ber to said supporting member, said mounting means comprising:

a housing having first and second generally parallel ends having first and second openings therethrough respectively;

a spring within said housing;

a string having an end within said housing;

slip clutch means interposed between said string end and said spring; and

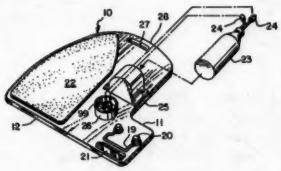
first and second stems coupled to said spring and said string respectively, and extending through said first and second openings and first and second rims on said first and second stems for engaging the first and second ends of the housing for limiting the elongation of said spring and manually engageable disk on one of said stems for imparting rotational movement to wind up said string to wind up said spring.

4,880,198

CRANKING BOARD FOR GASOLINE POWERED HAND TOOL

Henry E. Brewer, 3900 Fowler Rd., Springfield, Ohio 45502

Filed Apr. 10, 1987, Ser. No. 36,945
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—346 **9 Claims**



1. A cranking board for a hand tool powered by a gasoline engine having a starter of the pull-cord type comprising:

an engine support portion for supporting said tool during operation of said starter

an engine support portion rigidly conected to said engine support portion and substantially co-planar therewith for supporting the knees of a person operating said starter, and

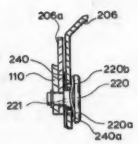
bracket means mounted on said engine support portion for engaging said tool and resisting rotation thereof during operation of said starter, said cranking board being free of attachment to any supporting structure and being adapted for use at ground level.

4,880,199

POWERED SIX-WAY SEAT ADJUSTOR AND MECHANISMS THEREFOR

William J. J. Harney, Markham, Canada, assignor to Magna International Inc., Markham, Canada

Filed Jul. 12, 1988, Ser. No. 217,951
Claims priority, application Canada, Jul. 13, 1987, 541927
Int. Cl.[4] F16M *11/24*
U.S. Cl. 248—396 **5 Claims**



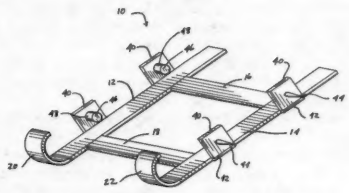
1. An improved pivot assembly comprising a pivot means upon which a seat adjuster pivots, a bracket means having an elongated slot in which a fastening means for the pivot means is contained, a lining portion affixed to the bracket means the lining portion having flanges extending through the elongated slot laterally away from the lining portion, the flanges having a predetermined curvature, a fastening means passing through the lining portion, bracket means and pivot means, whereby when the fastening means is affixed to the pivot means through the bracket means the flanges of the lining portion are biased against the fastening means, thereby the tolerance of the improved pivot assembly are optimized to allow a minimum of play or chuck amongst the components thereof.

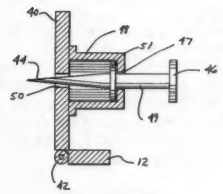
4,880,200

LADDER BRACKET

Joel Champagne, and Rejean Champagne, both of 75 Groveland Terr., Newington, Conn. 06111

Filed Dec. 6, 1988, Ser. No. 280,435
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—547 **1 Claim**





1. A ladder bracket for supporting a ladder having a plurality of spaced rungs on an intended work surface, comprising:

a pair of parallel side rails;

a pair of spaced transverse struts connecting said parallel side rails;

first end portions of said side rails being curved into hooks dimensioned for engagement with a ladder rung;

a plurality of securement tabs on each of said side rails, said tabs disposed in spaced aligned pairs and each connected by a hinge to an outer side edge of one of said side rails; said tabs each mounted for pivotal movement about an axis extending parallel with the longitudinal axis of said side rails;

each of said securement tabs having:

(a) a hollow cylindrical boss;

(b) aligned reduced diameter apertures extending through a top face of said boss and through said tab;

(c) an elongated fastener having an enlarged head at one end and a pointed tip at an opposite end, said fastener inserted through said aligned apertures and through said cylindrical boss, said enlarged head of said fastener disposed above said boss; and

(d) an elongated diameter retaining flange on said fastener and captured within said boss, whereby said securement

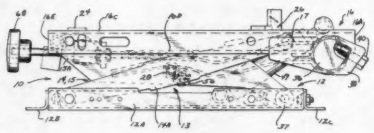
tabs are pivotal to a wide variety of positions to allow securement of said ladder bracket to various differently configured intended work surfaces.

4,880,201

CONSTANT NATURAL FREQUENCY, MECHANICAL SPRING SEAT SUSPENSION

Garth O. Hall, and Harvey N. Tengler, both of New Berlin, Wis., assignors to Bostrom Seating, Inc., Cudahy, Wis.

Filed Dec. 3, 1987, Ser. No. 128,033
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—575 **15 Claims**



1. A seat suspension system in which the spring rate (K) of a spring means may be varied in accordance with the applied load (W) so as to render the quantity (K/W) constant and cause the system to exhibit a constant natural frequency with different loads applied to the system, said system comprising:

base means;

frame means suitable for receiving the load applied to the system;

linkage means extending between said base means and frame means for joining said base means and frame means together while permitting relative vertical movement between said base means and frame means, said linkage means comprising two spaced pairs of crossed links;

mechanical spring means mounted on one of said base means and frame means;

a lever coupled to said spring means for loading said spring means by arcuate movement of said lever and

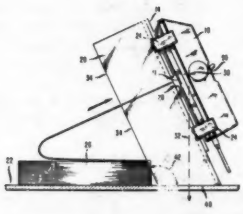
fulcrum means slidably mounted on said linkage means and engaging said lever, said fulcrum means being movable with respect to said lever for altering the spring rate (K) of said spring means in accordance with the applied load (W) to maintain the quantity (K/W) constant.

4,880,202

COMPUTER PRINTER STAND

Edward J. Gauss, Lincroft, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 25, 1988, Ser. No. 224,050
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—676 **1 Claim**



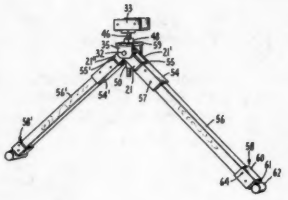
1. A combination comprising a computer printer having a bottom paper feed slot, a printer stand having a paper feed slot in a top surface, means for fixing the computer printer to the top surface of the printer stand, the printer stand having a bottom surface positioned so that the center of gravity of the computer printer and the printer stand is directly over the bottom surface when the computer printer and the printer stand are in a normal position for printer operation, and the printer stand having a rear surface positioned so that the center of gravity of the computer printer and the printer stand is directly over the rear surface when the computer printer and the printer stand are raised up from the front into a position for loading paper into the bottom paper feed slot.

4,880,203

ADJUSTABLE FORM BRACE

Grove R. Holcomb, 1135 Pine Ridge Dr., and Bruce M. Douglas, 4370 Bridle Way, both of Reno, Nev. 89509

Filed Oct. 19, 1988, Ser. No. 260,185
Int. Cl.[4] B66F *13/00*
U.S. Cl. 249—24 **14 Claims**



1. A cradle assembly adapted to receive a first leg and a second leg to form an adjustable form brace, each of said first and second legs having an upper portion adapted to be attached to the cradle assembly and having a lower portion adapted to be placed against a support beams supporting an elevated concrete form deck, said cradle assembly comprising:

a first leg socket for receiving the first leg and a second leg socket for receiving the second leg, the first and second leg sockets each having a first end and a second end and being attached together said first ends for pivotal movement of the second ends toward and away from each other in a plane, and the second end of said first leg socket being adapted to receive and hold the upper portion of the first leg and the second end of said second leg socket being adapted to receive and hold the upper portion of the second leg;

a supporting means for supporting a shoring member placed beneath the concrete form deck, said supporting means being movably attached to the first ends of the first and second sockets; and,

a height adjusting means for moving the supporting means in said plane away from or towards the first ends of the first and second sockets.

4,880,204

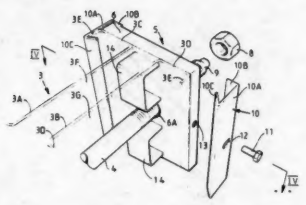
LOAD TRANSMITTING DEVICE

Raymond E. Steele, Warwickshire, Great Britain, assignor to Rapid Metal Developments Ltd., Aldridge, England

Filed Jul. 12, 1988, Ser. No. 218,292
Claims priority, application United Kingdom, Jul. 17, 1987, 8716855; Mar. 23, 1988, 8806911
Int. Cl.[4] E04G *17/06*
U.S. Cl. 249—219.2 **3 Claims**

1. A load transmitting device for use in transmitting load from a tie rod to a beam used as a support for a concrete casting formwork, said beam having at least one web member with oppositely extending adjacent lateral flanges at one end of the web member, each lateral flange having a free end portion which extends towards an end of the web member opposite said one end, said device comprising a bridging member having a dimension to bridge between and overlie outer surfaces of the adjacent lateral flanges of the beam, and restraint means

acting, in use, between said bridging member and a surface of the beam facing generally oppositely to said surfaces overlaid by the bridging member in such a manner as to resist bending of said lateral flanges as a result of bending force applied to the bridging member by a tie rod loading the lateral flanges at a right angle to the longitudinal direction of the beam, the restraint means being shaped so as to provide surfaces which lodge, in use, under the free end portions of the adjacent lateral



flanges in order to resist said bending of the flanges, wherein the bridging member is a plate and the restraint means are generally U-shaped members having a base and respective arms at opposite ends of the base, said U-shaped members embrace the plate and the free end portions of said adjacent lateral flanges and wherein the U-shaped members are secured to the bridging member by screw means extending through the base and into the bridging member.

4,880,205

HUNG DIAPHRAGM SOLENOID VALVE

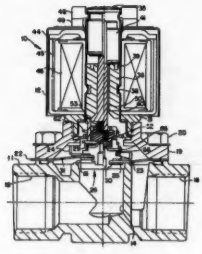
John E. Ellison, Mayfield Heights, Ohio, assignor to Parker Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 68,591, Jun. 30, 1987, Pat. No. 4,783,044. This application Feb. 5, 1988, Ser. No. 252,684

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[4] F16K *31/385*

U.S. Cl. 251—30.02 **10 Claims**



1. A solenoid valve, comprising

a valve body having a main valve seat,

a diaphragm valve supported in said body for movement toward and away from said main valve seat, said diaphragm valve assembly comprising a diaphragm valve, means for limiting valve movement and a pilot valve seat,

a plunger assembly supported for movement toward and away from said pilot valve seat, said plunger assembly comprising a valve disc engageable with said pilot valve seat for controlling fluid flow therethrough, main spring means engaged between said plunger assembly and said valve body for biasing said plunger assembly away from said valve seat and a plunger for moving said plunger assembly,

an electromagnet mounted on said body for actuating said plunger in response to electrical current, and

a pickup spring joining said plunger assembly and said diaphragm valve assembly for providing bias force upon said diaphragm valve assembly.

4,880,206

MAGNETIC VALVE

Corneliu Lungu, Bühlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

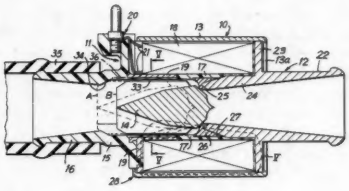
PCT No. PCT/DE87/00119, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO87/05981, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 19, 1987, Ser. No. 272,882

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610122

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.21 **21 Claims**



1. A magnetic valve, particularly a two-way magnetic valve, for controlling flow of fluid medium in a device for heating passenger space in a vehicle having a liquid cooled internal combustion engine, or the like, said magnetic valve comprising an inlet member defining a valve inlet; an outlet member defining a valve outlet; a valve seat located between the valve inlet and the valve outlet; a closing member movable between an open position in which it is spaced from said valve seat, and a closed position in which it sealingly engages said valve seat; and magnet coil means for generating a magnet field for moving said closing member from said open position to said closed position, said magnet coil means including a coil body having an opening therethrough through which the medium flows, and a guide tube for guiding said closing member in its movements, said closing member forming a magnet armature for said magnet coil means, said valve seat having a seat annular surface, said closing member being progressively tapered in a streamlined manner in a flow direction of medium away from said seat annular surface, and said closing member being movable from the closed position thereof to the open position thereof only under action of one of flow forces and pressure forces generated by a medium flow.

4,880,207

INTAKE THROTTLE VALVE RETURN DEVICE OF ENGINE

Osamu Matsumoto; Mamoru Sumida, and Hirokazu Machara, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00227, § 371 Date Oct. 13, 1988, § 102(e) Date Oct. 13, 1988, PCT Pub. No. WO88/06682, PCT Pub. Date Sep. 7, 1988

PCT Filed Mar. 1, 1988, Ser. No. 314,353

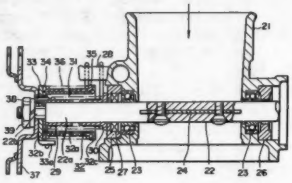
Claims priority, application Japan, Mar. 2, 1987, 62-47025; Mar. 2, 1987, 62-47026; Mar. 2, 1987, 62-472027; Mar. 2, 1987, 62-47028; Mar. 2, 1987, 62-47029

Int. Cl.[4] F16K *1/22*

U.S. Cl. 251—337 **10 Claims**

1. An intake throttle valve return device of engine, comprising: a throttle valve disposed within a barrel of engine; a valve shaft supported in a diametral direction through said barrel, on

which said throttle valve is secured, with at least one end side thereof extending outwardly as a shaft end portion; an inner torsion coil spring and an outer torsion coil spring which are disposed concentrically with said shaft end portion, and each end being retained by a spring retainer of said barrel; a spring holder having a flange section on the outer periphery of other end of a bottomed cylindrical part, said cylindrical part being positioned between said both torsion coil springs, with a clear-



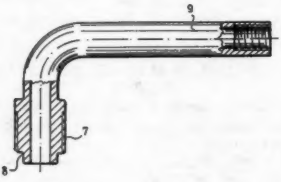
ance provided between said other end and said barrel where one end of said inner tension coil spring passes to be retained, at said bottom portion, by the end portion of said valve shaft, and said flange section holding said outer torsion coil spring from disengaging in the axial direction; and an engaging member, which is secured at bottom with said spring holder at the end portion of said valve shaft, and retains each other end of said inner torsion coil spring and said outer torsion coil spring.

4,880,208

TWO-PIECE VALVE SYSTEM FOR BODIES TO BE FILLED WITH A GASEOUS MEDIUM, LIQUID, IN PARTICULAR FOR PRODUCTS OF THE RUBBER INDUSTRY

László Palotás, Budapest; Géza László, Nyíregyháza; Lázlo Horvath; Árpádné Baria, both of Budapest; Barnabás Márion, and Ferencné Szarka, both of Nyíregyháza, all of Hungary, assignors to Taurus Gumiipari Vallalat, Budapest, Hungary

Filed Jul. 22, 1988, Ser. No. 222,942
Int. Cl.[4] F16L *5/00, 33/00*
U.S. Cl. 251—356 **6 Claims**



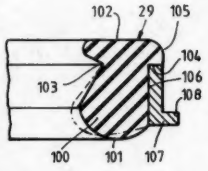
1. A two-part valve system comprising a valve body embedded into a rubber socket and a valve stem connected thereto with a thread, wherein the valve body is embedded in its full height in the rubber socket, on the inner wall of the throughbore of the valve body a connecting thread is formed while the outer wall of the valve stem is also provided with a connecting thread and in the inside of the valve body and on the threaded end of the valve stem seats are formed for receiving an O-ring.

4,880,209

SEALING WASHER FOR TAPS

Bernat, Georg, Narre Warren, Australia, assignor to Dorf Industries Pty. Ltd., Victoria, Australia

Filed Aug. 12, 1988, Ser. No. 231,394
Claims priority, application Australia, Aug. 14, 1987, PI3746
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—363 **4 Claims**



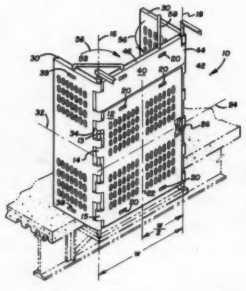
1. A sealing washer, for the end of a tap top assembly of the type including an end housing containing a ceramic disc assembly, and for engagement with a valve seat within a tap body, said sealing washer normally engaging said ceramic disc assembly and comprising a ring of resilient compressible material surrounded by a sleeve of rigid material with a radially outwardly extending flange forming part of said sleeve and positioned whereby, in use, upon excessive compression of said resiliently compressible material said flange will engage the end of said housing containing the ceramic disc assembly to retransmit the excessive compressive forces to said housing rather than said ceramic disc assembly.

4,880,210

REMOVABLE AND STACKABLE HOISTWAY DOOR ASSESMBLY

Fred Cucksey, Belmont, Calif., assignor to Specialty Hoisting Services, Inc., Newark, Calif.

Filed Feb. 8, 1988, Ser. No. 153,228
Int. Cl.[4] E04H *17/16*
U.S. Cl. 256—26 **19 Claims**



1. A stackable hoistway door structure, comprising:

a center member having a vertical centerline pivotable about a first or a second axis, the center member having latch means for latching or unlatching the center member and the center member having hinge means and stack means for stacking multiple hoist door assemblies said stack means being symmetrical along the vertical centerline; and

first and second wing members, the first and second wing members having hinge means compatible with the center member hinge means for hinging the wing members on the center member, the wing members being pivotable about

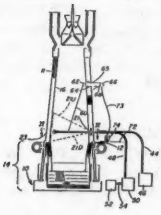
the first or the second axis, the wing members being able to pivot such that each wing member contacts the center member at its limit of rotation, the wing members being interchangeable, and each wing member having stack means for stacking multiple hoist door assemblies compatible with the center member stack means.

4,880,211

METHOD AND APPARATUS FOR RELINING A REFRACTORY LINED VESSEL

James D. Head, 207 Highland Dr.; Edward F. Burns, 207 Leeds Dr.; William A. Schleizer, 4 Division Rd., all of Valparaiso, Ind. 46383; C. Douglas White, 2401 Riverview Dr., Chesterton, Ind. 46304, and Dennis L. Gentry, 9216 W. 143rd Pl., Cedar Lake, Ind. 46303

Continuation-in-part of Ser. No. 924,405, Oct. 29, 1986, Pat. No. 4,793,595. This application Dec. 20, 1988, Ser. No. 286,889
Int. Cl.[4] C21B *13/00, 15/00*
U.S. Cl. 266—44 11 Claims



1. Apparatus for relining the interior surface of a refractory lined vessel comprising,

an elongated supply pipe extending into the interior of said vessel, said supply pipe being movably supported on a sill portion of said vessel,

said supply pipe having an outlet end facing the interior surface of said vessel wall opposite said sill and an inlet end extending outside of said vessel,

said supply pipe having a first rigid portion and a movable portion, said movable portion connected to said elongated supply pipe outlet end,

means pivotally supporting said supply pipe on said sill portion to permit said supply pipe outlet end to pivot horizontally and vertically,

means to supply material to be sprayed to said inlet end of said supply pipe,

means to introduce air under pressure to said inlet end of said supply pipe to propel said material to be sprayed through said supply pipe and impinge on the interior surface of said vessel wall,

means to control the supply of said material to be sprayed,

means to control said flow of air under pressure,

means to maintain the axis of said supply pipe movable portion aligned with the axis of said supply pipe rigid first portion, and

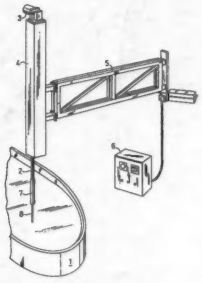
means to pivotally raise and lower said outlet end of said supply pipe relative to the axis of said supply pipe rigid first portion.

4,880,212

DEVICE FOR DETECTING THE LEVEL OF THE SLAG IN A METAL POOL

Hans Hägglund, Örsundsbro; Lars Ericsson, and Rudolf Wiklund, both of Täby, all of Sweden, assignors to Geotronics Metaltech AB, Sweden

Continuation-in-part of Ser. No. 938,881, Dec. 8, 1986, abandoned. This application Jul. 26, 1988, Ser. No. 225,620
Claims priority, application Sweden, Sep. 28, 1987, 8703728
Int. Cl.[4] C21C *5/28*
U.S. Cl. 266—94 10 Claims



1. A device for detecting the level of a slag interface in a molten metal bath, said device comprising:

a lance,

means coupled to said lance for moving said lance towards said molten bath level,

an antenna provided at a downward end of said lance for coaction with said slag interface when said moving means moves said towards said slag interface,

a sensitive detection circuit connected to said antenna, said antenna during its downward movement being capacitively coupled to said slag layer, said detection circuit being arranged to detect predetermined impedance change(s) at the antenna provided as said antenna is moved towards the interface, said detection circuit comprising:

an oscillator (31) having a frequency which is different from the mains frequency,

a network supplied by the oscillator and having the antenna and its possible antenna supply (32) in one branch and a tap point (A;20;A') separated from the oscillator supply point and connected to said antenna via an antenna supply cable provided if needed,

said detector being a synchronous detector having a reference-signal input which is connected to the oscillator (31) and a measuring-signal input which is connected to said tap point,

that the synchronous detector (33, 38) provides a D.C. output dependent without mistake on the change quality of the continuously existing signal at said tap point indicating the degree of capacitive coupling change between the antenna and the slag, and

that a threshold circuit (310) is connected to the synchronous detector output for supplying an output signal when the continuously existing signal at said tap point has a predetermined change quality indicating that the antenna is located a given distance from the interface corresponding to a given degree of capacitive coupling between the antenna and the slag.

4,880,213

GAS SPRING APPARATUS

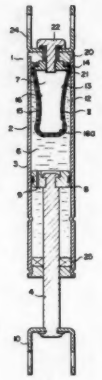
Takeyoshi Shinbori, Yokosuka; Ichiro Takadera, Tokyo, and Kohei Taguchi, Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 6,622, Jan. 22, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 212,109

Claims priority, application Japan, Jan. 30, 1986, 61-10974; Jun. 13, 1986, 61-137470

Int. Cl.[4] F16F *9/04*

U.S. Cl. 267—64.27 **20 Claims**



1. A gas spring apparatus comprising:

a cylinder assembly including at least one cylinder housing and a rod, said rod being fitted in said cylinder housing and being movable in the axial direction of said cylinder housing, said cylinder assembly further including an oil chamber for containing oil and a gas chamber for containing gas;

damping force generating means disposed inside said cylinder assembly, and being adapted to damp reciprocation of said rod by means of viscous resistance produced when the oil in said cylinder assembly is circulated; and

a flexible bladder in the form of a bag, located between said oil chamber and said gas chamber and extending at least partly into said oil chamber, said gas chamber being defined inside the hollow of said bladder and said oil chamber being defined outside the hollow of said bladder, said bladder dividing said gas chamber from said oil chamber, and said oil in said oil chamber contacting an outer surface portion of said bladder;

said bladder including a flexible elastomer body made of an oil impervious elastomer having a thickness of from about 0.1 mm to about 5 mm so as provide a gas-barrier characteristic to substantially prevent passage of said gas therethrough, and a gas-barrier film made of a non-elastomeric material impermeable to said gas forming an inner surface of said bladder that is directly exposed to said gas chamber, said non-elastomeric gas-barrier film having a gas-barrier characteristic which is better than that of said elastomeric body, said gas barrier characteristic of said gas-barrier film being not more than about 1×10^{-11} cc-cm/(cm^2-sec-cmHg), said elastomer body covering the outer surface of said gas-barrier film to protect said gas-barrier film, and said elastomer body being thicker than said gas-barrier film, said oil contacting said outer surface portion of said bladder contacting said elastomeric body to prevent said elastomer body from drying out and to provide lubrication if said elastomer body contacts a wall of said cylinder assembly.

4,880,214

CUSHIONING AND PROTECTING MEMBERS

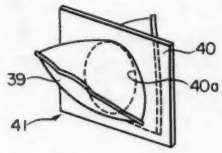
Emiko Sukai, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 20, 1987, Ser. No. 28,402

Claims priority, application Japan, Mar. 29, 1986, 61-46437[U]; Aug. 29, 1986, 61-203136

Int. Cl.[4] F16M *1/00*; F16F *1/36*; B65D *85/30*; F16L *41/00*

U.S. Cl. 267—136 **3 Claims**



1. A cushioning and protecting device to be disposed between a case and an article to be contained in the case, comprising:

a substantially planar supporting plate having opposed first and second surfaces and including a plurality of spaced-apart holes extending therethrough;

a plurality of cushions insertable in said spaced-apart holes, said cushions protruding from said first and second surfaces when said cushions are inserted in said supporting plate, each of said cushions comprising a tubular film having a first seam and a second seam, said second seam being spaced longitudinally from said first seam and being substantially perpendicular to said first seam; and

said supporting plate being insertable between the article and the case, said cushions engaging said article and said case when said supporting plate is inserted between the article and the case.

4,880,215

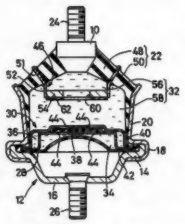
FLUID-FILLED ELASTIC MOUNTING STRUCTURE

Motohiro Katayama, Kasugai, and Tatsuya Suzuki, Komaki, both of Japan, assignors to Tokai Rubber Industries, Ltd., Japan

Filed Aug. 5, 1988, Ser. No. 228,676

Int. Cl.[4] F16F *13/00*; B60K *5/12*

U.S. Cl. 267—140.1 **9 Claims**



1. A fluid-filled elastic mount for flexible coupling of two members, comprising:

first support means and second support means which are disposed opposite to each other in a load-receiving direction in which a vibrational load is applied to the elastic mount;

an elastic body interposed between said first and second support means, for elastic connection of said first and second support means, said elastic body including a truncated cone portion having a shape similar to a truncated cone;

a closure member secured to said second support means and

cooperating with at least said elastic body to define a fluid chamber filled with a non-compressible fluid, said closure member including a flexible portion;

first partition means for driving said fluid chamber into a pressure chamber formed on the side of said first support means, and an equilibrium chamber formed on the side of said second support means;

means for defining a first restricted passage for restricted fluid communication between said pressure-receiving chamber and said equilibrium chamber; and

second partition means comprising a hollow member including a first portion embedded in an intermediate portion of said truncated-cone portion of said elastic body which is intermediate said first and second support means, said truncated-cone portion being separated by said first portion of said hollow member into a small-diameter part secured to said first support means and a large-diameter part secured to said second support means, said hollow member further including a second portion positioned within said pressure-receiving chamber, said second partition means further comprising a plate-like member which is secured to said second portion of said hollow member such that said hollow member and said plate-like member divide said pressure-receiving chamber into a first section formed on the side of said first support means, and a second section formed on the side of said first partition means, said plate-like member having a second restricted passage formed therethrough for restricted fluid communication between said first and second sections of said pressure-receiving chamber.

4,880,216

TWO-CHAMBER ENGINE BEARING WHICH HAS HYDRAULIC DAMPING

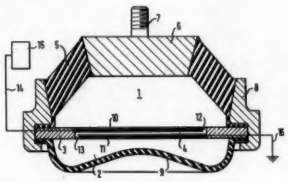
Volker Härtel, Germering; Dieter Theisen, Lohhof, and Günter Oppermann, Leverkusen, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,714

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336965

Int. Cl.[4] F16F *13/00*; B60K *5/12*

U.S. Cl. 267—140.1 **4 Claims**



1. Two-chamber engine bearing with hydraulic damping, comprising rubber-electric peripheral walls, a rigid intermediate plate defining upper and lower chambers along with said peripheral walls, said intermediate plate mechanically separating said chambers from each other, two mutually parallel flat plate electrodes disposed in said intermediate plate, said plate electrodes having a given width and being spaced apart from each other by a given distance defining a line therebetween with a given cross section and two ends, said line having two slot-shaped passages formed therein each connecting a respective one of said ends of said line with a respective one of said chambers, a hydraulic electroviscous liquid filling and interconnecting said chambers through said line, and a voltage source connected to said plate electrodes for generating an electric field controlling the viscosity of said liquid.

4,880,217

ANNULAR SPRING DESIGN

Joseph Navarro, Sr., 300 E. Baltimore Pike, Clifton Heights, Pa. 19018, and Joseph Navarro, Jr., Vineland, N.J., assignors to Joseph Navarro, Sr., Clifton Heights, Pa.

Filed Jul. 25, 1988, Ser. No. 223,544

Int. Cl.[4] F16F *1/04*

U.S. Cl. 267—167 **17 Claims**

1. An annular spring formed from a straight spring, comprising:

(a) an intertwining region where an end coil from a first end of the straight spring is intertwined with a coil near a second end of the straight spring, with each said end coil aligning with the annular spring's inside and outside diameter;

(b) at least one spot weld joining said end coil from first end of said spring to coil near the second end;

so that the tension in each said end coil pulls against the tension in the opposite end coil.

4,880,218

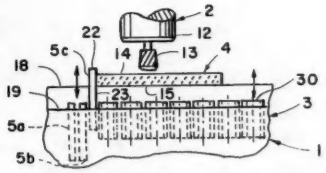
PROGRAMMABLE BED FOR MACHINE TOOLS AND THE LIKE

David G. Greene, Arden, N.C., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Dec. 3, 1987, Ser. No. 128,493

Int. Cl.[4] B25B *11/00*

U.S. Cl. 269—21 **18 Claims**



1. A programmable bed for machine tools and the like, comprising:

a platen having a work surface adapted to support a variety of differently sized workpieces thereon adjacent an associated machine tool;

means for selectively retaining each of the different sized workpieces on the work surface of said platen at a preselected position to coordinate with the associated machine tool;

a plurality of retractable stops mounted in said platen; each of said stops having a retracted position wherein said stop is disposed wholly below the work surface of said platen to permit the workpieces to move freely thereover, and an extended position wherein at least a portion of said stop is disposed above the work surface of said platen to abut an associated one of the workpieces, and thereby locate the same at the preselected position on the work surface of said platen;

means for selectively and individually shifting said stops between the extended and retracted positions in response

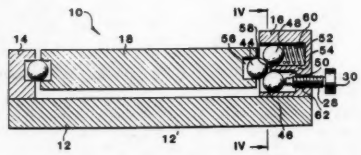
to identification of one of the differently sized workpieces to be machined, whereby the differently sized workpieces can each be automatically indexed at their preselected position on the work surface of said platen to facilitate machining.

4,880,219

TILTING APPARATUS

Robert Nemirovsky, 1117 Hyman Ave., Bay Shore, N.Y. 11706, assignor to Robert Nemirovsky, Bay Shore, N.Y. and Joseph Deutsch, Commack, N.Y.

Filed Apr. 27, 1988, Ser. No. 186,889
Int. Cl.[4] B23Q *3/18*
U.S. Cl. 269—60 **15 Claims**



1. A tilting apparatus comprising:
a. a base;
b. a platform movably attached to the base;
c. a first element disposed in said platform and having a first curved surface; and
d. a second element disposed in said base and having a second curved surface in contact with said first curved surface, said first and second curved surface cooperating to tilt said platform with respect to said base when a force is applied to one of said first and second elements;
e. wherein said base includes force application means for applying said force to said second element; and
f. wherein said force tilts said platform in a first direction, said apparatus further comprising a third element for applying a counteracting force on one of said first and second elements for tilting said platform in a second direction.

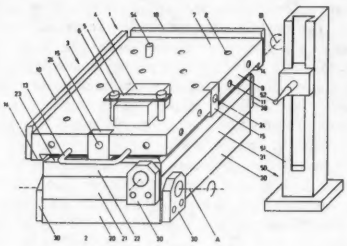
4,880,220

DEVICE FOR HOLDING AN OBJECT IN A SPATIAL POSITION

René Büchler, Sonnental, Switzerland, assignor to Buchler B-SET AG., Flawil, Switzerland

Continuation of Ser. No. 709,259, Mar. 7, 1985, abandoned. This application Dec. 12, 1986, Ser. No. 942,012
Claims priority, application Switzerland, Mar. 9, 1984, 1185/84
Int. Cl.[4] B23Q *1/04*
U.S. Cl. 269—71 **8 Claims**

1. An apparatus for setting an object in a desired position in a horizontal plane, comprising:
(A) a base having a surface in the horizontal plane;
(B) a first member pivotably connected to the base so that the first member can be pivoted between either a position parallel to the surface of the base or a position perpendicular to the surface of the base about an axis A;
(C) a pallet coupled to the first member, the pallet being capable of bearing an object thereon and being pivotable with the first member between either the position parallel to the surface of the base or the position perpendicular to the surface of the base;
(D) a measuring column which is placed adjacent to the base and which has a measuring probe located at a predetermined vertical distance above a surface upon which the base and the column are placed;
wherein the desired position of the object along a directional perpendicular to the axis A is set by pivoting the first member to the position perpendicular to the surface of the base and positioning the object with respect to the measuring probe; and
(E) a second member which is pivotably connected to the first member about an axis B so that the second member can be pivoted between a position parallel to the surface of the base and a position perpendicular thereto, wherein the axis A is at right angles to the axis B, and the pallet is slidably attached to the second member and pivotable



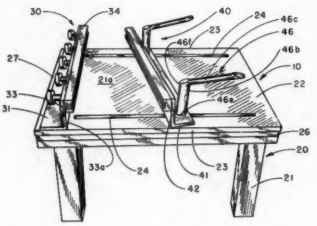
with said second member between the position parallel to the surface of the base and the position perpendicular to the surface of the base, and wherein the desired position of the object along a direction perpendicular to the axis B is set by pivoting the second member to the position perpendicular to the surface of the base and positioning the object with respect to the measuring probe;
wherein the pallet is provided with a cylindrical pin mounted thereon, the circumferential surface of which is used as a reference surface for the measuring probe.

4,880,221

TABLE FOR HOLDING WORK PIECES FOR DRILLING, CUTTING AND THE LIKE

David M. Richards, 205 Washington, Ida Grove, Iowa 51445

Filed Apr. 24, 1987, Ser. No. 42,047
Int. Cl.[4] B25B *1/02*
U.S. Cl. 269—139 **7 Claims**



1. A work piece holding table, comprising:
a table top having planar, parallel top and bottom surfaces and two parallel, longitudinally oriented slots;
ground support means for holding said table top at work height;
an elongated torque jaw, L-shaped in cross-section having a generally vertical leg and a generally horizontal leg and affixed to said table to at a right angle to the slots therein;
an elongated sliding jaw L-shaped in cross-section, having a generally vertical leg and a generally horizontal leg, said sliding jaw extending transversely across both of said slots in said table top and having two holes in its horizontal leg positioned for alignment with said slots; and
two coacting releasable fasteners operatively associated

with said two holes and two slots for adjustably affixing said sliding jaw to said table top; and

one of the two holes in said sliding jaw being elongated in a direction for rotational movement of said sliding jaw upon release of said coacting fasteners whereby said sliding jaw can be affixed to said table top at an acute angle to said torque jaw,

a pair of elongated jaw means, one of said jaw means being mounted on the vertical leg of said sliding jaw at a position to face said torque jaw, means for mounting the other of said jaw means on the vertical leg of said torque jaw at a position to face said sliding jaw and with freedom of movement toward and away from the vertical leg of said torque jaw,

the vertical leg of said torque jaw including a plurality of threaded holes aligned with said other jaw means and a plurality of torque knobs, each including a threaded shank threadably received in a respective one of said threaded holes and a hand-turning means affixed to one end of said shank being engageable with said other of said jaw means for urging said other jaw means toward said sliding jaw in response to rotation of said torque knob in one direction thereby to apply clamping pressure to a work piece supported between said pair of jaw means.

4,880,222

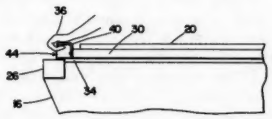
PATIENT SUPPORT FOR RADIATION IMAGING

Kenneth J. Dragmen, Sr., South Euclid, Ohio, assignor to Picker International, Inc., Cleveland, Ohio

Division of Ser. No. 850,021, Apr. 10, 1986, Pat. No. 4,715,591. This application Oct. 19, 1987, Ser. No. 109,417

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—322 **3 Claims**



1. A table assembly for use in creating radiographic images of patients under examination comprising:

a. a table base;

b. a table top having a substantially planar patient examining surface and a longitudinal dimension;

c. means for mounting the table top to the table base for movement along a path substantially parallel to the longitudinal dimensions of said table top and maintaining a clearance space between said table top and said table base; and

d. a guard structure mounted to at least one end of the table top for preventing placement of patient fingers around the table top end and into the clearance space, said guard structure comprising a flexible plate extending outward from the table top end at an angle obtuse to the patient examining surface and defining an edge above the clearance space for grasping by the patient.

4,880,223

SORTER HAVING A MECHANISM FOR DRIVING BINS STEPWISE

Hideo Yamazaki, Tokyo, and Kazunori Kubota, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 55,348, May 29, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,554

Claims priority, application Japan, May 31, 1986, 61-126720

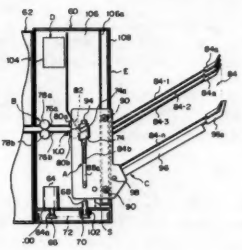
Int. Cl.[4] B65H *39/10*

U.S. Cl. 271—293 **6 Claims**

1. A sorter having a helical cam bin driving mechanism for moving a plurality of bins, which are arranged in multiple steps stacked one upon another sequentially and intermittently to a sheet delivery position to deliver sheets to each of said respective bins, said sorter comprising:

a bin group made up of said bins, each of said bins being provided with pins which protrude sideways from both sides of a base end of a bottom plate of said pin and aligned so as to be engaged by said helical cam;

bin support frame members for supporting the bins such that said bins are movable individually to the sheet delivery position, said bin support frame members being provided with pin guides in which the pins of said bins are slidably received wherein said bin support frame members includes a pair of side plates which face each other, the pin



guides having elongate slots each being formed through a respective one of said side plates, each of said elongate slots having an abutment at an upper end thereof for engagement with the pins and wherein said plates having means fixedly attached thereto so as to fix each side plate to each other at the top and bottom thereof such that said bins are disposed therebetween; and

a drive means for driving said helical cam of said bin driving mechanism including an AC reversible motor, and a motor stop control circuit for, while said AC reversible motor is deenergized, rectifying an AC power source to apply braking current to said motor over a predetermined period of time.

4,880,224

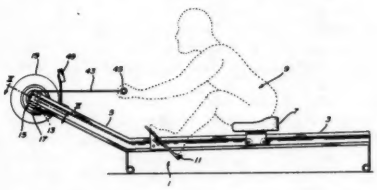
ROWING MACHINE

Werner Jonas, 1142 Ave. Des Erables, Apt. #1, Quebec, Quebec, Canada G1R 2N2, and Nathanial B. Findlay, 1045 Belvedere Ave., Apt. #226, Quebec, Quebec, Canada G1N 4L4

Filed Oct. 19, 1988, Ser. No. 259,737

Int. Cl.[4] A63B *69/06*

U.S. Cl. 272—72 **3 Claims**



1. A stationary rowing machine exercising device, comprising:

a frame member;

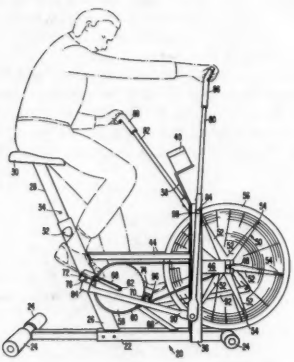
seat means mounted on said frame member and movable therealong;

feet rest means connected to said frame member;

a shaft mounted across said frame at one end thereof;

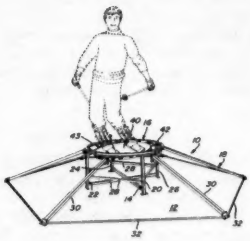
a flywheel mounted on said shaft;
means for rotatably driving said flywheel mounted on said shaft;
said means for rotatably driving comprising:
(i) a planetary gear system comprising:
(a) a rotatable carrier;
(b) pinion gears mounted in said carrier or on said carrier;
(c) a stationary ring gear;
(d) a central gear;
said pinion gears meshing with said central gear and said stationary ring gear;
(ii) said central gear being mounted on said shaft for rotation therewith;
(iii) spool means mounted on said carrier for rotation therewith;
(iv) cable means wound around said spool means for providing rotary motion to said spool means when said cable means is pulled by an exerciser during a rowing stroke;
whereby, said rotary motion of said spool is transferred to said flywheel, through said planetary gear system and said shaft, in a speed increasing mode.

4,880,225
DUAL ACTION CYCLE EXERCISER
James F. Lucas, Auburn, and Bruce F. Coody, Opelika, both of Ala., assignors to Diversified Products Corporation, Opelika, Ala.
Filed Jul. 28, 1988, Ser. No. 225,176
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 **3 Claims**



1. A cycle exerciser comprising:
a frame;
a transverse drive shaft journalled on said frame;
a pair of cranks respectively secured 180 degrees out of phase to opposite ends of said drive shaft so as to rotate therewith;
a foot pedal attached to the outboard side of each of said cranks and rotatable thereon about a transverse pedal axis;
a pair of oscillating handlebar levers pivotally mounted on said frame intermediate their ends ahead of said drive shaft for fore and aft movement on opposite sides of said frame;
a handle at the upper end of each of said handlebar levers;
a seat mounted on said frame above and aft of said drive shaft to position a user within reach of said foot pedals and said handles;
a pair of connecting rods at opposite sides of said frame, each connecting rod pivoted at its forward end to the lower end of the respective handlebar lever, and having at its rear end a rigidly attached upwardly projecting portion which is pivoted to the respective crank about the respective pedal axis, whereby rotation of said pedals and oscillation of said handlebar levers are synchronized and said connecting rods are located below said pedals throughout their revolution about said drive shaft; and
energy absorbing means on said frame operatively connected to said drive shaft for resisting rotation of said drive shaft caused by the user's rotation of said pedals and/or oscillation of said handlebar levers.

4,880,226
SKIING SIMULATOR
Peter Krantz, 217 Demers, Montreal, Quebec, Canada H2T 1K6
Filed Feb. 21, 1989, Ser. No. 312,192
Int. Cl.[4] A63B *5/00, 69/18*
U.S. Cl. 272—97 **7 Claims**



1. A skiing simulator comprising a platform, the platform including a peripheral frame and defining an opening, a subplatform provided within the opening and suspension means mounting the sub-platform to the peripheral frame for relative universal directional tilting movement therewith, the suspension means including tension means extending between the peripheral frame and the sub-platform and normally maintaining the sub-platform in the plane of the platform, the simulator being characterized in that the sub-platform defines a pair of openings having parallel longitudinal axes and a pair of boot receiving harnesses, one in each opening, means for mounting a ski boot in alignment with the longitudinal axis of each respective opening and rotatably about the respective longitudinal axis, such that a person standing on the subplatform with a foot in each respective boot harness can simulate the body movement of a skier during downhill skiing.

4,880,227
VARIABLE EXERCISER
Wendell L. Sowell, 4414 Brush Hill Rd., Nashville, Tenn. 37216
Filed Dec. 12, 1988, Ser. No. 283,088
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **11 Claims**

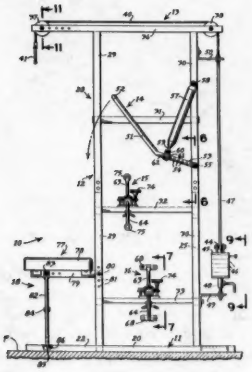
1. An exercise apparatus comprising:
(a) a base frame adapted to be supported upon a floor and having front and rear portions,
(b) an upright support frame projecting upward from said base frame,
(c) a seat station in front of said upright support frame,
(d) pulley means mounted on the upper portion of said upright support frame,
(e) a cable supported for movement over said pulley means and having front and rear ends on opposite sides of said pulley means,
(f) a cable handle on the front end of said cable above said seat station,
(g) detachable weight means mounted on said rear end of said cable,
(h) an exercise lever having front and rear end portions, and

means pivotally mounting said rear end portion on said upright support frame to permit vertical swinging movement of said front end portion above said seat station,

(i) resistive means connecting said exercise lever to said upright support frame to resist said swinging movement of said exercise lever,

(j) a first crank member having at least one first rotary crank arm and a crank handle on said first crank arm,

(k) first mounting means mounting said first crank member on said upright support frame above said seat station for longitudinal adjustable movement front-to-rear of said upright support frame,



(l) a second crank member having at least one second rotary crank arm and a pedal mounted on said second crank arm for rotating said second crank arm,

(m) second mounting means mounting said second crank member on said upright frame member behind and below said seat station and below said first mounting means for adjustable movement of said second crank member in a front-to-rear direction,

(n) said cable handle, said front end portion of said exercise lever, and said crank handle being spaced from said seat station within reach of a hand of the person seated in said seat station, and said pedal being spaced from said seat station within the reach of a foot of the person seated in said seat station.

4,880,228

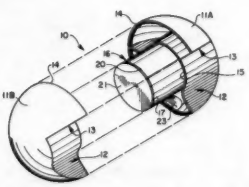
EXERCISE DEVICES

Scott Caruthers, Glen Burnie, Md., assignor to Dar Products Corporation, Baltimore, Md.

Division of Ser. No. 94,794, Sep. 14, 1987, Pat. No. 4,813,669. This application Oct. 14, 1988, Ser. No. 257,526

Int. Cl.[4] A63B *11/00*

U.S. Cl. 272—122 **6 Claims**



1. A method for forming an exercise device intended for strengthening a user's targeted muscle, comprising the steps of forming a pair of substantially hemispherical, relatively thin-walled housing portions, at least one of said housing portions having a cut-away portion, each of said housing portions further having an edge including an, arcuate rib, and each housing portions forming a concave inner walled portion; forming a cylinder having a pair of opposed ends, at least one of which is open; disposing the desired weight into the cylinder; inserting each opposed end into a respective concave inner walled portion, wherein each opposed end of the cylinder is received and supported; joining the arcuate ribs of each edge to one another, whereby a substantially spherical housing having a diametral axis and a cut-away portion is formed, and thereby the housing further has an opening formed therein substantially tangentially of the housing and communicating with the cut-away portion thereof.

4,880,229

WEIGHT PLATE FOR EXERCISE DEVICE

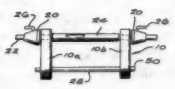
Robert Broussard, Playa del Rey, Calif., assignor to Progressive Health & Fitness, Los Angeles, Calif.

Continuation-in-part of Ser. No. 830,955, Feb. 19, 1986, Pat. No. 4,756,526. This application Mar. 31, 1988, Ser. No. 175,911

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] A63B *13/00*

U.S. Cl. 272—123 **12 Claims**



1. For use with an exercise apparatus of the type comprising

(a) a pair of longitudinally separated weight plates for providing a movable weight-training mass and 5 having respective centers for gravity;

(b) a generally cylindrical lifting bar extending generally longitudinally between the weight plates and mounted thereto at first respective locations on the plates offset from said respective centers of gravity;

(c) means for permitting rotation of the weight plates about the lifting bar as the apparatus is moved by a user; and

(d) a leverage bar extending generally longitudinally between the pair of weight plates and mounted thereto for rotation therewith at respective second locations on the weight plate means different from the respective first locations, the leverage bar being positioned to rotate with the weight plates about the lifting bar so as to contact the outer forearm of the user during the exercise movement,

a weight plate having front and back faces, the faces being generally symmetrical about respective first axes of symmetry and being asymmetrical about respective second axes, the first and second axes associated with each face being relatively orthogonal, the points of intersection of the two sets of first and second axes being co-linear with the plate's center of gravity, the plate including

first mounting means for mounting the weight plate to a lifting bar, said first mounting means being located with respect to at least one face at a first position on said first axis and offset from the from the intersection of the face's first and second axes,

a first discontinuous surface feature associated with one of the front and back faces, and

a second discontinuous surface feature associated with the other of the front and back faces, the first and second surface features being respectively interengagable with corresponding second and first features of adjacent weight plates on the apparatus to cause the plates to move in general unison about the lifting bar.

4,880,230

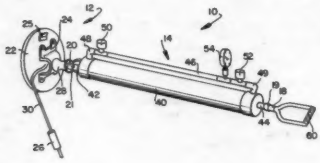
PNEUMATIC EXERCISE DEVICE

Gerry Cook, 1708 Park View Pl., Bozeman, Mont. 59715

Filed Jun. 28, 1988, Ser. No. 212,429

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—130 **5 Claims**



1. A portable, stand-alone, pneumatic exercise device comprising:

a closed double-acting pneumatic cylinder having first and second ends, the cylinder enclosing a moveable piston element;

a first and second operating chambers positioned within the cylinder on opposite sides of the piston element;

a suction cup for mounting the exercise device to a surface external to the exercise device;

a pivotal connection means for pivotally connecting the suction cup and the pneumatic cylinder;

a shaft connected to the piston and extending through a sealed end wall on the second end of the double-acting pneumatic cylinder;

a pneumatic line located outside the double-acting pneumatic cylinder and interconnecting the first chamber and the second chamber to allow air to flow between the first and second chambers;

a first valve means for adjusting the rate of flow in the pneumatic line in one direction;

a second valve means for selectably adjusting the rate of flow in the pneumatic line in the opposite direction;

a gauge means located between the two valve means to indicate pressure in the line; and

a quick coupling fitting connected to the end of the shaft opposite the piston;

an exerciser engaging means for connecting to the quick coupling fitting to enable a user to push and pull the piston as well as move the second end of the cylinder pivotally with respect to the suction cup whereby a user can exercise selected muscle groups.

4,880,231

ACTION TOY GAME APPARATUS

Toshio Kobayashi, Chiba, Japan, assignor to Asahi Corporation, Tokyo, Japan

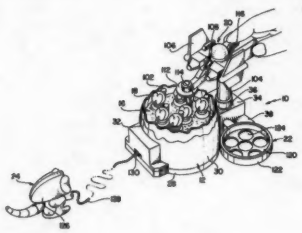
Filed Nov. 18, 1988, Ser. No. 273,223

Claims priority, application Japan, Nov. 19, 1987, 62-176690[U]

Int. Cl.[4] A63F *9/06*

U.S. Cl. 273—1 GD **3 Claims**

1. An action toy-game apparatus comprising a base, a timer on said base actuable for a set period of time, rotatable platform means on said base operatively connected to said timer for rotation during said set period of time, a plurality of game elements receivable in upright positions on said platform means for rotation therewith during said set period of time, retrieving means for individually retrieving said game elements from said platform mean, one of either said retrieving means or each of said game elements comprising magnet means, the other one of either said retrieving means or each of said game elements comprising magnetically responsive means, said retrieving means being operative for individually magnetically retrieving said game elements from said platform means during rotation



of said platform means, means for upsetting any game elements remaining on said platform means and positioned in the upright positions upon the expiration of said set period of time, and a tethered character figure which is operatively connected to said timer so that it is drawn toward said base during said set period of time and positioned at a location which is closely adjacent said base upon the expiration of said set period of time.

4,880,232

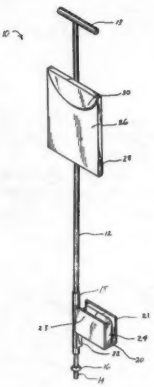
FLAG PIN GOLF BALL DISTANCE MEASURING DEVICE

James P. Lang, 11 Cedar Ct., Mobile Manor, Richmond, Ind. 47374

Filed Jul. 8, 1988, Ser. No. 216,401

Int. Cl.[4] A63B *57/00*

U.S. Cl. 273—32 B **4 Claims**



1. A flag pin golf ball distance measuring device for measuring the distance of a golf ball from a hole on a putting green, comprising:

an elongated cylindrical pin;

a lower end of said pin dimensioned for insertion into and registry with a standard golf hole cup;

a hollow sleeve received for longitudinal sliding movement around said pin;

a right angle bracket having a first leg extending parallel with a longitudinal axis of said sleeve and secured thereto;

a second leg of said bracket extending perpendicular to the longitudinal axis of said sleeve;

a pair of spaced parallel side walls extending perpendicularly upwardly from opposed side edges of said second leg;

a spring roller type tape measured removably received on said second leg, between said parallel side walls; and

a free end of a measuring tape of said tape measure secured to said sleeve.

4,880,233

GAME BALL

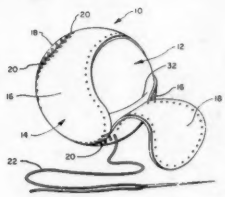
Chul-Ho Song, Seoul, D.P.R. of Korea, assignor to Seoul Nassau Corporation, Seoul, Rep. of Korea

Continuation of Ser. No. 9,266, Jan. 30, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 253,081

Claims priority, application D.P.R. of Korea, Nov. 15, 1986, 86-9646

Int. Cl.[4] B29C *27/08*; A63B *37/12*

U.S. Cl. 273—60 R **13 Claims**



1. A substitute baseball for safely teaching young and inexperienced players the skills developed by playing with an otherwise hard and heavy regulation baseball, the substitute baseball comprising:

(a) a cover replicating the appearance, texture, and surface features of a regulation baseball, thereby producing in said substitute baseball the feel and aerodynamic behavior of a regulation baseball, said cover comprising:

(i) first and second pieces of thin material cut in the pattern of the pieces of the cover of a regulation baseball, said first and second pieces having a texture on the outer surface thereof that resembles leather and being provided at the edges thereof with a plurality of perforations in a continuous sequence parallel said edges; and

(ii) raised herringbone stitching threaded between said perforations on said first piece and said perforations on said second piece, thereby securing the edges of said first piece to said edges of said second piece in a single continuous raised ridge of stitching disposed in the pattern of the stitching of the cover of a standard baseball, said ridge of stitching presenting an elevated gripping feature on the surface of said cover and contributing to aerodynamic behavior in said substitute baseball that replicates the aerodynamic behavior of a regulation baseball; and

(b) a flexible, hollow spherical core formed of a homogeneous synthetic rubber material and enclosed within said cover, the outer diameter of said core and the thickness of the walls thereof being such that said core with said cover thereon has a weight of 2.50 to 3.50 ounces and a circumference in the range of 9.00 to 9.25 inches, whereby the substitute baseball due to the increased flexibility of the walls thereof and the lightness thereof compared with that of a regulation baseball affords an enhanced margin of safety to young and inexperienced players.

4,880,234

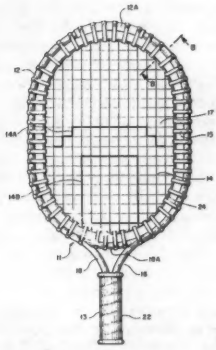
TRAINING RACKET FOR PROPELLING BASEBALLS AND SOFTBALLS

William F. Salisbury, 264 East 700 South, Springville, Utah 84663

Continuation of Ser. No. 579,343, Feb. 13, 1984, abandoned. This application Jul. 18, 1988, Ser. No. 220,464

Int. Cl.[4] A63B *51/04, 51/14*

U.S. Cl. 273—73 L **19 Claims**



1. A racket for propelling baseballs and softballs comprising an open frame having an elongate handle attached to and extending outwardly from an end of said frame, a detachable net having a flexible perimeter smaller than the perimeter of the open frame; a plurality of self-holding, individually adjustable stretch strips spaced about the frame and interconnecting the perimeter of the net with the frame to thereby hold the net tautly within the frame, each of said stretch strips being an elongate strip of resilient material having an opening near one end and each of said strips being looped about the perimeter of the net with ends extending to the outside of said frame with the end of the strip opposite the end with the opening passed through the opening and with the strips positioned such that the ends of the strips are held between the frame and intermediate portions of the strips to thereby hold the strips in looped formation.

4,880,235

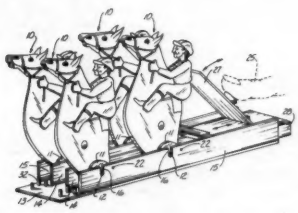
SIMULATED ANIMAL RACING TRACK APPARATUS

William H. Groenewold, 1435 Shawnee, BourBonnais, Ill. 60914

Filed Oct. 24, 1988, Ser. No. 261,160

Int. Cl.[4] A63F *9/14*

U.S. Cl. 273—86 R **4 Claims**



1. A simulated animal race track apparatus comprising:

a track; having upstanding walls and a reset bar slideably disposed on top of one of the upstanding walls wherein the

reset bar is provided with a first plurality of spaced projections which extend in the direction of the other of the upstanding walls; and, wherein the reset bar is operatively engaged to the said one of the upstanding walls;

a first plurality of animal-shaped members spaced apart in a first line sequentially from one end of said track to the other end thereof;

a second plurality of animal-shaped members spaced apart in a second line sequentially from one end of said track to the other end thereof;

means for independently, pivotally attaching each of said first animal-shaped members along a horizontal axis, each of said first animal-shaped members being mounted for pivotal movement about a different horizontal axis wherein each of said horizontal axes is equally spaced from each other adjacent horizontal axis;

means for independently, pivotally attaching each of said second animal-shaped members along a horizontal axis, each of said second animal-shaped members being mounted for pivotal movement about a different horizontal axis wherein each of said horizontal axes associated with said second animal-shaped members is equally spaced from each other adjacent horizontal axis associated with said second animal-shaped members;

means for holding each animal-shaped member in an over-center generally upright position;

means for permitting each of said animal-shaped member to pivot to a tipped position into contact with the animal-shaped member directly in front of it for causing the sequential pivoting of each animal-shaped member from said upright to said tipped position thereof; and,

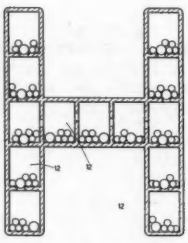
means attached to one end of said track for simultaneously starting a first pair of said animal-shaped members to move from the upright to said tipped position; wherein said first plurality of spaced projections are adapted to engage opposed pairs of animal-shaped members operatively disposed on said track.

4,880,236

GAME DEVICE

Sheng-Lee Hwang, No. 84, 6F-3, Sec. 3, San-Min Rd., Taichung City, Taiwan

Filed May 11, 1988, Ser. No. 192,614
Int. Cl.[4] A63B *67/14*
U.S. Cl. 273—113 **1 Claim**



1. A game device comprising:

(a) a transparent housing having a substantially H-shaped configuration;

(b) a plurality of spaced partition plates dividing the interior of the housing into a plurality of compartments arranged in a configuration having two spaced rows and a transverse row interconnecting the spaced rows, each of the partition plates having a through-hole therein to provide communication between two adjacent compartments;

(c) a first game piece freely moveable and confined within each of the compartments, each first game piece being capable of blocking the through-hole of the partition plate;

(d) a plurality of second game pieces freely moveable under gravity from one compartment to another compartment through the through-hole; and

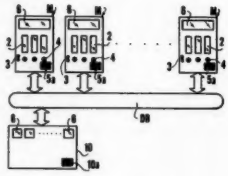
(e) wherein the game device is played by holding the housing and moving, tilting or shaking the housing so as to selectively move a desired number of the second game pieces from at least one compartment into a lower compartment through the through-hole, and controlling the movement of the housing to prevent the first game piece from blocking the through-hole while the second game piece falls therethrough.

4,880,237

TOKENLESS SLOT MACHINE SYSTEM

Ryutaro Kishishita, 109 Yamatecho, Naka-ku, Yokohama, Kanagawa, Japan

Filed Dec. 29, 1987, Ser. No. 139,313
Claims priority, application Japan, Nov. 30, 1987, 62-302125
Int. Cl.[4] A63F *9/22*; A63B *67/00*; G06F *15/28*
U.S. Cl. 273—138 A **5 Claims**



1. A slot machine system comprising:

a game data processing unit which is provided with:

an input unit having a keyboard for inserting input data, said input data including a user's identification code and number of game media available for wagering,

a storage unit in which said input data is readably stored,

an operation unit for performing arithmetic processing of said input data,

a printer for printing said input data and an incorrect version of said input data on opposing sides of a card, said printer being able to provide the card to a user, and

a first display for displaying said input data and the results of said arithmetic processing; and a slot machine body which is provided with:

a pattern display mechanism comprising three or more second displays on which patterns are displayed,

a start means for changing said patterns,

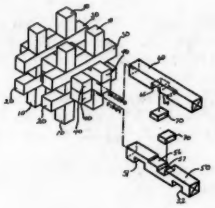
a stop means for stopping the changing of said patterns,

a win decision unit for deciding whether a pattern line of said stopped pattern display mechanism wins a game and for supplying the output to said data processing unit,

a write unit for recording said input data and the results of said arithmetic processing performed in said game data processing unit, and

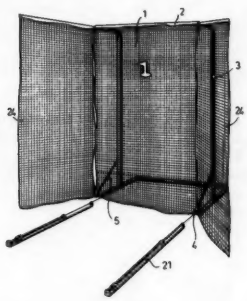
a data entry unit having a keyboard for receiving entered data including a user's identification code and a number of game media to be wagered by the identified user, said number of game media to be wagered not being predetermined by said system, whereby said fame can be started when the identification code in said input data corresponds to the identification code in said entered data and the number of game media to be wagered is no more than the game media available for wagering.

4,880,238
LOCKING PUZZLE
Louis G. Derouin, P.O. Box 545, Gibbons, Alberta, Canada T0A 1N0
Filed Jun. 15, 1988, Ser. No. 206,717
Int. Cl.[4] A63F 9/12
U.S. Cl. 273—160 5 Claims



1. A puzzle comprising an arrangement of elongate blocks each being square and equal in cross section and having the same length, said blocks being provided with suitably located rabbets so as to permit interlocking thereof into an assembled puzzle, two of said blocks being adapted to receive a pair of locking members such that in a first orientation of said assembled puzzle said two blocks and said locking members retain said puzzle in an assembled, locked position and in a second rotated orientation said locking members allows said two blocks to unlock thereby permitting disassembly of said puzzle.

4,880,239
GOLF TRAINING APPARATUS
Michel R. Leneveu, 20 avenue de la République, Presles, France
PCT No. PCT/FR87/00003, § 371 Date Aug. 31, 1987, § 102(e) Date Aug. 31, 1987, PCT Pub. No. WO87/04082, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 6, 1987, Ser. No. 101,180
Claims priority, application France, Jan. 6, 1986, 86 00150
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—181 F 18 Claims



11. A sports training apparatus for ball hitting games and comprising:

a frame which includes a base as well as at least one upright,

a net depending from the upright and having at least one lower net corner, the lower net corner connected to a weight organized to ride along an inclined member spanning between the base and a higher point on the upright, whereby displacement of the weight measures impact of the ball into the net.

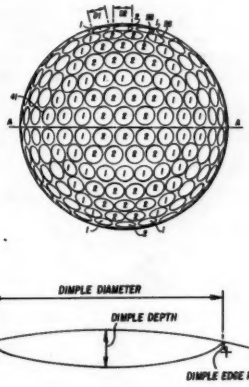
4,880,240
PUTTING PRACTICE DEVICE
John F. Lewis, P.O. Box 363, Quebec, Canada J0P 1J0
Filed Sep. 22, 1988, Ser. No. 247,766
Claims priority, application Canada, Sep. 25, 1987, 547815
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—188 R 19 Claims

1. Apparatus for assisting a golfer while putting, said apparatus comprising in combination:

a golf putter having a grip with a flat surface above the rear end of the putter head, said flat surface being aligned at right angles to the face of said putter head; and

a guide means including means for attaching same to the waist of said golfer, said guide means providing a guiding surface cooperable with the flat surface of said putter grip for directing the putting stroke in a predetermined plane.

4,880,241
GOLF BALL
Terrence Melvin, Somers, Conn., and R. Dennis Nesbitt, Westfield, Mass., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Apr. 22, 1988, Ser. No. 184,910
Int. Cl.[4] A63B 37/12
U.S. Cl. 273—232 8 Claims



1. A golf ball having two poles and an equator and having a preselected number of diplomas arranged in a geometrical lattice configuration, said configuration comprising

a first plurality of dimples having a predetermined diameter, D1, lying along the lattice lines of said configuration, said diameter, D1, being between 0.150 and 0.160 inch;

a second plurality of dimples lying within said geometrical

lattice, substantially all of said second plurality of dimples having a predetermined diameter, D2 between 0.160 and 0.170 inch; and

the edge radius, R, of said first and second plurality of dimples being between 0.090 and 0.110 inch.

4,880,242

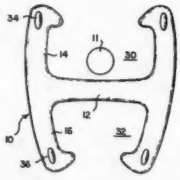
GAME APPARATUS AND METHOD OF PLAYING A GAME USING THE SAME

Ordie S. White, 3922 41st St., New Brighton, Pa. 15066

Filed Feb. 26, 1988, Ser. No. 160,731

Int. Cl.[4] A63B *67/06, 65/00*

U.S. Cl. 273—336 **20 Claims**



1. A game projectile comprising:

a. a central bar member;

b. two first legs connected to and extending generally perpendicularly from the ends of said central bar member such that the distance between the ends of said first legs remote from said central bar member comprises a first opening;

c. two second legs connected to and extending generally perpendicularly from the ends of said central bar member in a direction generally away from said first legs, such that the distance between the ends of said second legs remote from said central bar member comprises a second opening which is smaller than said first opening; and

d. said first legs being inwardly curved toward one another to form said first opening and said second legs being inwardly curved toward one another to form said second opening.

4,880,243

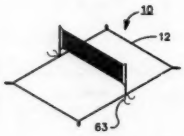
PORTABLE PLAYING COURT DEMARCATION APPARATUS AND METHOD FOR FABRICATION THEREOF

Walter B. Raub, 2111 Union Way, Lakewood, Colo. 80215

Filed Jan. 31, 1989, Ser. No. 304,565

Int. Cl.[4] A63B *71/02*

U.S. Cl. 273—411 **22 Claims**



1. A portable playing court demarcation apparatus for marking a boundary of a rectangular court for playing a game, the court having back boundaries of a length equal to a court width and side boundaries of a length equal to a court length defining a court perimeter, the apparatus comprising:

a continuous, endless flexible outer boundary demarcation element of a length greater than a distance about the perimeter of the court to be marked, said demarcation element including four loop segments, each loop segment forming a loop of predetermined circumference, the element crossing itself at a corner point at the base of each loop at generally a right angle such that the longitudinal distance along said demarcation element between consecutive loop segments is alternately equal to the court length and the court width.

4,880,244

MOUNTING FOR A SEALING RING

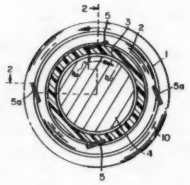
Christian Greune, Fuerstenfeldbruck, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 107,246, Oct. 9, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 300,731

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636165

Int. Cl.[4] F16J *15/44, 15/54*

U.S. Cl. 277—174 **10 Claims**



1. A sealing device for sealing a gap between a rotating shaft and an inner wall of a bore in a shaft support member (10) through which the shaft passes, comprising an endless sealing ring (3), a carrier ring (2) for supporting said endless sealing ring (3) in said bore, first rigid movement permitting means operatively inserted between said endless sealing ring and said carrier ring at two approximately diametrically opposite first locations for movably securing said endless sealing ring (3) to said carrier ring (2) at said two first locations, and second rigid movement permitting means operatively inserted between said carrier ring (2) and said shaft support member (10) also at two approximately diametrically opposite second locations for movably securing said carrier ring in said shaft support member (10) at said two second locations, said first and second rigid movement permitting means being angularly spaced from each other by about 90°, said carrier ring supporting said endless sealing ring exclusively through said first rigid movement permitting means.

4,880,245

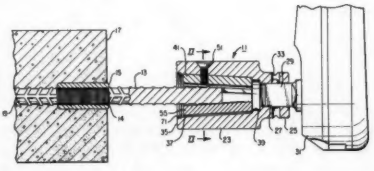
CHUCK FOR CONCRETE SLAB DOWELS

Bob Autrey, Azle, Tex., assignor to Carbonic Systems of America, Inc., Tolar, Tex.

Filed Apr. 29, 1988, Ser. No. 188,281

Int. Cl.[4] B23B *31/00*

U.S. Cl. 279—1 R **14 Claims**



1. A chuck for use in rotating a member, comprising in combination:

a housing having a polygonal socket on one end for receiv-

ing a polygonal drive head of a wrench to rotate the housing with the wrench;

the housing having a bore extending from an opposite end toward the socket;

a plurality of retainers releasably mounted in the bore in a circular array, each retainer having edges on opposite sides that are spaced apart from the edges of the adjacent retainers to define a receptacle between each of the retainers;

a plurality of blades, each releasably inserted into one of the receptacles, each blade having an inner edge that defines with the edges of the other blades a conical space that converges toward the socket for gripping the member; and

securing means for securing the blades in the receptacles.

4,880,246

SELF-TIGHTENING DRILL CHUCK

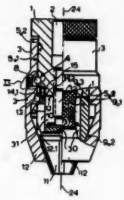
Günter H. Rohm, Heinrich-Röhm-Strasse 50, D-9727 Sontheim, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 274,384

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739165

Int. Cl.[4] B23B *31/12*

U.S. Cl. 279—1 K **6 Claims**



1. A self-tightening drill chuck comprising:

a chuck body adapted to be mounted on a drill spindle for rotation about an axis and formed with substantially cylindrical front and a rear outer surfaces both centered on the axis and axially offset from each other and with an outwardly open groove between the front and rear surfaces;

a tightening sleeve surrounding the body and formed with substantially cylindrical front and rear inner surfaces both centered on the axis and riding on the front and rear surfaces of the body and with an inwardly open groove between the front and rear inner surfaces and forming with the groove of the body an annular generally circular-section passage, the sleeve also being unitarily formed with a rearwardly flared substantially frustoconical seat also centered on the axis;

rollers riding in the grooves and supporting the sleeve on the body so as to permit relative rotation of the body and sleeve about the axis while preventing relative axial displacement;

a jaw guide in the sleeve formed with a plurality of axially forwardly open and angularly spaced slots;

respective jaws axially and radially displaceable in the slots and on the seat; and

spring means braced axially between the guide and the chuck body for urging the guide axially forward and pressing the jaws axially forward against the seat.

4,880,247

CUTTING TOOLS

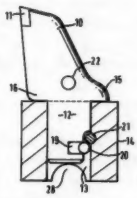
Frederick J. Herridge, Buckinghamshire, England, assignor to Anderson Strathclyde PLC, High Wycombe, England

Filed Jun. 6, 1988, Ser. No. 202,300

Claims priority, application United Kingdom, Jun. 6, 1987, 8713298

Int. Cl.[4] E21C *25/46*

U.S. Cl. 279—79 **12 Claims**



1. A combination of a cutting tool and a holder defining a socket for receiving a shank of the cutting tool, wherein the shank includes a slot extending transversely to its longitudinal axis, an elongate locking bar mounted in the slot and projecting therefrom, and resilient means biassing the bar into its projecting position and wherein the holder includes an elongate abutment member releasably connected thereto and co-operable with the locking bar to retain the shank within the socket.

4,880,248

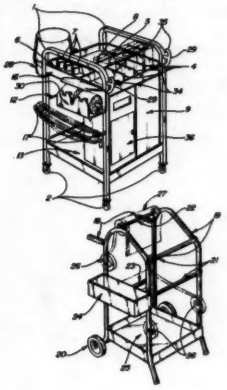
MANUALLY PROPELLED AUTOMOTIVE PAINTING TOOL CART

Mark Elmer, 1067 W. Parkwood, Flint, Mich. 48507

Filed May 3, 1988, Ser. No. 189,659

Int. Cl.[4] B62B *3/02*

U.S. Cl. 280—47.35 **3 Claims**



1. A manually propelled automotive painting tool cart comprising:

(a) a main unit comprising:

(1) a pair of utilitarian, tubular, essentially inverted U-shaped support frames,

(2) wheels attached to said frame unit,

(3) a top tray unit attached essentially horizontally near the top of maid inverted U-shaped frame,

(4) at least one partition located within said top tray unit

which provides compartments for the storage of tools and supplies,

(5) at least one shelf unit located below the top tray unit providing horizontal storage shelves and vertical storage shelves,

(6) at least one tool storage bar attached to said U-shaped frame,

(7) at least one lower tray unit attached essentially horizontally to said main unit,

(8) at least one exterior storage element attached to said main unit for storing tools exterior of the volume defined by said U-shaped support frames;

(b) at least one auxiliary unit comprising;

(1) a pair of utilitarian, tubular, essentially inverted U-shaped support frames,

(2) at least one dispenser for rolled paper attached to said U-shaped frames,

(3) at least one large tray unit attached substantially horizontally to said U-shaped frames,

(4) wheels attached to the bottom of said auxiliary unit,

(5) at least one substantially horizontal bar attached to said U-shaped frames providing means for storage and support,

(6) at least one small tray unit attached substantially horizontally to said U-shaped frames, and

(7) at least one tape dispenser wheel unit attached to said auxiliary unit, and

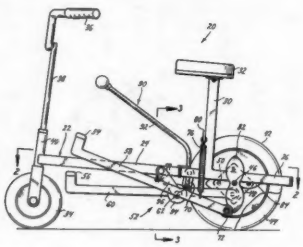
(c) a connection means whereby said main unit is removably attached to said at least one auxiliary unit allowing the combination of said main unit and said at least one auxiliary unit to function as a single unit.

4,880,249

PEDAL OPERATED VEHICLE WITH CAM AND CAM FOLLOWER DRIVE ASSEMBLY

Frank Gray, 6508 River Farm Dr., St. Louis, Mo. 63129, and LeRoy Stienbarger, Pressott Rd., P.O. Box 454, Licking, Mo. 65542

Filed Jun. 27, 1988, Ser. No. 211,762
Int. Cl.[4] B62M *1/04*
U.S. Cl. 280—253 **10 Claims**



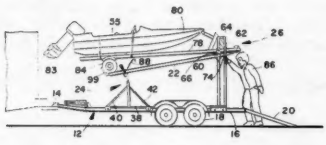
7. In a self-propelled vehicle, the vehicle having a frame, a seat secured to the frame for supporting a rider, and a plurality of wheels supporting the frame, the improvement comprising a drive mechanism including a pair of pedals, each of said pedals having an associated cam follower connected thereto, a drive axle, a pair of cams, at least one of said wheels and said cams being mounted to the drive axle, means to urge the cams and cam followers together, and said pedals having means to propel the vehicle by creating relative movement between the cams and cam followers.

4,880,250

ATTACHMENT KIT FOR MOBILE FLATBED FOR CARRYING TWO VEHICLES

Timothy J. Cravens, and James A. Cravens, both of 8056 Bellhaven Ave., Pasadena, Md. 21122

Continuation-in-part of Ser. No. 108,001, Oct. 14, 1987, abandoned. This application Aug. 30, 1988, Ser. No. 238,262
Int. Cl.[4] B60P *3/08, 3/10*
U.S. Cl. 280—414.1 **35 Claims**



1. A kit for attaching to a moblie flatbed suitable for transporting a first vehicle, said kit enabling the mobile flatbed to transport a second vehicle thereon, said kit comprising:

a tiltable ramp suitable for supporting the second vehicle thereon,

first means, for supporting said tiltable ramp, said first ramp supporting means supporting one portion of said tiltable ramp in an elevated position with respect to the mobile flatbed, said first support means including means for connecting the mobile flatbed thereto, said first support means including a fulcrum serving to divide said tiltable ramp into a short lever arm portion and a long lever arm portion,

means for preventing the second vehicle, located on said tiltable ramp from being dislocated from said tiltable ramp,

second means for supporting said tiltable ramp, said second ramp support means supporting the long lever a portion of said tiltalbe ramp in an elevated poisition, and

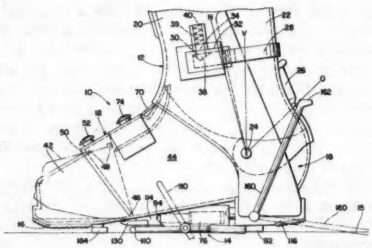
means for adjusting the center of gravity of the second vehicle and said tiltable ramp with respect to said fulcrum whereby said tiltable ramp is readily tilted manually.

4,880,251

SKI BOOT AND SAFETY BINDING

Elmer B. Wulf, 1907 Jasmine, Denton, Tex. 76205, and Mark E. Wulf, 24447 Boulevard DeJohn, Plainfield, Ill. 60544

Filed Jul. 27, 1988, Ser. No. 224,887
Int. Cl.[4] A63C *9/08*
U.S. Cl. 280—613 **40 Claims**



1. In combination, a ski boot and a binding for releasably attaching the ski boot to a ski, comprising

a. first connecting means secured to the ski beneath the boot,

b. second connecting means secured to the boot, said second connecting means spanning said first connecting means with portions in a fore-and-aft relationship generally along

the length of the ski, the fore portion being located beneath the boot and at least part of said aft portion being located beneath the boot,

c. means for releasably coupling said first and second connecting means so that said first and second connecting means may be separated in the forward, backward, or lateral directions, or a combination thereof, under predetermined load conditions, said coupling means including

i. a major plunger means and a minor plunger means aligned with one another in the same direction and generally parallel to the longitudinal axis of the ski, one of said plunger means being located in said first connecting means and the other of said plunger means being located in said second connecting means,

ii. first and second spaced and aligned socket means, each being engaged by one of said plunger means, one of said socket means being located in said first connecting means and the other of said socket means being located in said second connecting means,

iii. each of said plunger means including means adjustably urging said plunger means into engagement with its respective engaged socket means, and

d. means for temporarily withdrawing one of said plunger means from its engaged socket means to permit separation of said first and second connecting means without load thereon.

4,880,252

SKI SAFETY BINDING

Gerhard Nowak, Biedermannsdorf; Klaus Kruschik, Gumpoldskirchen; Hans P. Morbitzer, Vienna; Rudolf Theuer, Trumau, and Alfred Winter, Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

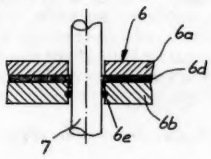
PCT No. PCT/EP87/00443, § 371 Date May 2, 1988, § 102(e) Date May 2, 1988, PCT Pub. No. WO88/01191, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 12, 1987, Ser. No. 199,046

Claims priority, application Austria, Aug. 14, 1986, 2199/86

Int. Cl.[4] A63C *9/081, 9/088*

U.S. Cl. 280—618 **10 Claims**



1. A ski binding for a ski with an electronic analyzer connected to force pickups emitting electrical signals, a power supply, for instance a battery, and an electro-mechanical release member including at least one stop means for releasably engaging a control member for controlling a locking mechanism for restraining a heel piece, comprising:

a closed housing having a wall and supporting the electromechanical release member, the control member including a shaft passing through said wall of said closed housing and said shaft being insulated from outside weather conditions by a seal means.

4,880,253

DRIVING FORCE TRANSMITTING STRUCTURE FOR AUTOMATIC SEAT BELT APPARATUS

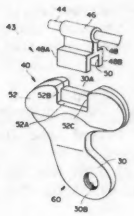
Yuji Nishimura, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jan. 12, 1988, Ser. No. 143,038

Claims priority, application Japan, Jan. 13, 1987, 62-003336[U]

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—804 **15 Claims**



1. A driving-force transmitting structure for an automatic seat belt apparatus comprising:

a sliding member being movable by a driving force of a driving means in a direction of movement and having a groove extending from a neck portion in said direction of movement; and

a slider having a fitting portion for mating with said groove and a pair of opposed surfaces for facing end surfaces of said sliding member which face in the direction of movement of said sliding member, and being connected to a webbing for restraining an occupant and applying said webbing around said occupant by movement in response to movement of said sliding member, said driving-force transmitting structure being adapted for transmitting said driving force to said slider through said sliding member, wherein side surfaces of said sliding member are opposed to side surfaces of said slider to positively locate said sliding member along said side surfaces of said slider.

4,880,254

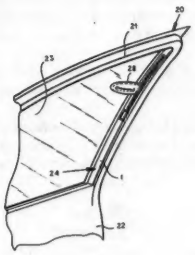
ADJUSTABLE GUIDE FOR A VEHICLE SAFETY BELT

Olaf Müller, Rüsselsheim, Fed. Rep. of Germany, assignor to R. Schmidt GmbH, Lennestadt, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,753

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—808 **18 Claims**



1. A safety-belt guide assembly for an automotive vehicle, comprising:

a rectangular cross-section tube formed as a rear upright frame member of an automotive vehicle side window and having a first side turned in a direction of travel of the

vehicle and a second side opposite said first side, said first side being formed with an upright slit;

a slide received in said tube and provided with and arm projecting outwardly through said slit and formed with a passage externally of said tube through which a safety belt is guided, said slide being movable up and down in said tube; and

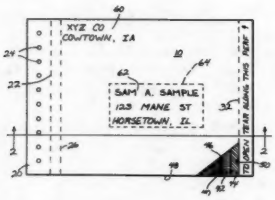
mating formations on said second side of said tube and on said slide mutually engageable at a plurality of heights of said slide in said tube for securing said slide against movement at a selected one of said heights and by a tilt of said slide corresponding to a downward movement of said arm, said mating formations being mutually disengageable upon an opposite tilting movement of said slide to enable said slide to be shifted to another of said heights.

4,880,255

MULTIPLE PLY BUSINESS FORM

George F. Zehner, Jr., Crystal Lake, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Dec. 27, 1988, Ser. No. 289,699
Int. Cl.[4] B41L *1/20*
U.S. Cl. 282—11.5 A **11 Claims**



1. A business form comprising:

a plurality of superimposed plies, including an upper ply, a bottom ply and a plurality of intermediate plies;

first means at one longitudinal edge of said plies securing all of the plies together;

a first line of weakening in at least some of said plies just inwardly of said first means and extending generally parallel to said one longitudinal edge whereby individual ones of said some plies may be separated from the remainder of said plies;

said upper and bottom plies having substantially equal widths;

second means at the longitudinal edges of said upper and bottom plies remote from said one longitudinal edge securing said upper and bottom plies together;

a second line of weakening in at least one of said upper and bottom plies adjacent and generally parallel to said remote longitudinal edge and just inwardly of said second means;

said intermediate plies having different widths and not greater than the distance between said one longitudinal edge of said upper and bottom plies and said second line of weakening; and

a cut-out in one of said upper and bottom plies inwardly of said second line of weakening for exposing the ends of said intermediate plies nearest said second line of weakening.

4,880,256

TEXTILE LABEL

Juan Ferre-Blanquez, Guifre 572-576, 08912 Barcelona, Spain

Division of Ser. No. 100,932, Sep. 25, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 325,063
Claims priority, application Spain, Nov. 12, 1986, 86-01308
Int. Cl.[4] B42D *15/00, 9/00*; G09C *1/00*
U.S. Cl. 283—92 **4 Claims**

1. A textile label for identifying textile goods or garments having incorporated therein a stitched logotype consisting of words, numbers, geometrical shapes, or symbolic figures, said logotype consisting of at least one phosphorescent thread,

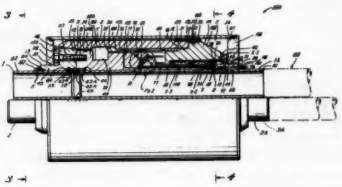
whereby the source and nature of the goods or garments may be authenticated.

4,880,257

PRESSURE COMPENSATION MULTI TUBULAR SAFETY JOINT

Marvin L. Holbert, Jr., Houston, Tex., assignor to Max Bassett, Houston, Tex.

Filed Mar. 23, 1983, Ser. No. 478,054
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—2 **14 Claims**



1. A coupling for releasably joining together in sealed relationship a first, second, third and fourth segments of a tubular system having a flowing fluid under pressure flowing therethrough and having force applied thereto, comprising:

a first tubular member connected to the first segment;

a second tubular member connected to the second segment;

a third tubular member connected to the third segment, said third member juxtaposed to said first member;

a fourth tubular member connected to the fourth segment, said fourth tubular member juxtaposed to said second member;

seal means for sealing the juxtaposition of said tubular members;

holding means for holding said first tubular member and said third tubular member in abutment and for holding said second tubular member and said fourth tubular member in abutment;

said holding means including weak link means for decoupling said first member from said third member and said second member from said fourth member upon the application of a pre-determined axial force on one of the members through one of the segments below the elastic limit of any of the segments;

said holding means includes compensating means for compensating said weak link means for deviations of the force from axial hydraulic load acting on said seal means,

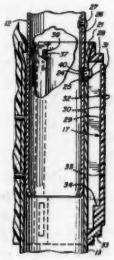
wherein there is further included lock-out means for preloading compressive force on said holding means for maintaining said tubular members in sealing juxtaposition.

4,880,258

VACUUM CLEANER WAND RELEASE STRUCTURE

Ennis L. Tillman, and James R. Caldwell, both of Danville, Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 7, 1988, Ser. No. 164,810
Int. Cl.[4] F16L *37/24*
U.S. Cl. 285—7 20 Claims



1. In a vacuum cleaner structure having first and second telescopically connectible flow passage elements, the improvement comprising:

cooperating releasable locking means on said flow passage elements to lock said elements in telescopic relationship including a resiliently biased lock element mounted to one of said flow passage elements including a manually depressible portion having a preselected small fingertip engagement area; and

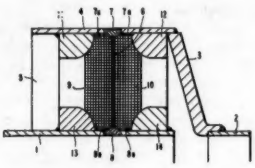
force transfer means mounted to the other of said elements and having a movable portion overlying said manually depressible portion of said locking means, said movable portion having an area substantially greater than said preselected fingertip engagement area of the locking element and defining means for transferring actuating force from a user's fingertip to said locking element for releasing said locking means.

4,880,259

HIGH-TEMPERATURE-RESISTANT TYPE COUPLING

Franz Dörge, Keltern; Udo Erlenmayer, Pforzheim; Bernd Faber, Lörrach; Winfried Herty, and Günter Munz, both of Pforzheim, all of Fed. Rep. of Germany, assignors to Fabrik Pforzheim, Pforzheim, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,380
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719840
Int. Cl.[4] F16L *55/04*
U.S. Cl. 285—137.1 22 Claims



1. A connection arrangement to connect two pipes, particularly for conveying hot fluids, especially exhaust gases from an internal combustion engine, said connection arrangement permitting relative movement of the two pipes with respect to each other in axial and angular direction, while maintaining a sealed connection and preventing escape of fluid to ambient space, and resisting movement with respect to torsional relative movement of the two pipes, comprising

means for defining a ring space (5, 24) surrounding the end portions of the pipes;

at least one sealing and support cushion or pillow (9, 10; 16, 17; 31, 32; 33, 34; 50, 51; 67, 68; 81, 82) located in the ring chamber or space, the material of said sealing and support cushions or pillows having damped springy characteristics and being temperature and corrosion-resistant;

a sealing membrane (6, 15, 24, 26, 41, 47, 54, 64, 77) positioned adjacent the sealing and support cushion or pillow and extending over the entire radial region of said ring chamber or space,

and wherein, in accordance with the invention,

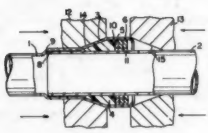
the sealing membrane (6, 15, 24, 26, 41, 47, 54, 64, 77) is welded along an inner and outer circumference thereof with adjacent walls (1, 4; 20, 23; 48, 49; 62, 63; 74, 75, 76) of said means for defining the ring chamber.

4,880,260

METHOD OF JOINING PIPES

Taiji Gotoh; Hidetoshi Yamamoto, and Kiyoshi Yamada, all of Kuwana, Japan, assignors to Mie Hooro Co., Ltd., Kuwana, Japan

Filed Dec. 31, 1987, Ser. No. 140,170
Int. Cl.[4] F16L *13/14*
U.S. Cl. 285—382.2 6 Claims



1. A method of joining a pair of thin walled pipes comprising the steps of:

forming one of the pipes with an enlarged diameter section near one end thereof, with a radially outwardly flared section widening from said enlarged diameter section towards said end of said one pipe;

placing an elastic gasket and a C-shaped rigid ring in said flared section;

inserting the other pipe inside said one pipe to extend into said enlarged section; and

deforming, only in the area of said flared section by the action of a pressure means applied to the exterior of said one pipe in the region of pipe overlap, the free end of said one pipe plastically inwardly towards the inserted pipe, thereby compressing the gasket into sealing engagement with the two pipes and compressing the C-shaped ring as said one pipe end is deformed into the inserted pipe so that the ring, while engaged by an inner wall of said one pipe, wedges into the outer wall of said inserted pipe.

4,880,261

REMOTE LATCH MECHANISM

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Jan. 28, 1988, Ser. No. 149,571
Int. Cl.[4] E05C *9/08*
U.S. Cl. 292—7 38 Claims

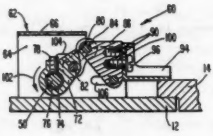
1. A remote latching mechanism comprising:

(a) a longitudinal connecting member rotatably movable about a longitudinal axis thereof;

(b) actuator means for rotating said connecting member about its longitudinal axis;

(c) a latch assembly operably connected to said connecting member for movement between latched and unlatched conditions in response to rotational movement of said connecting member;

(d) wherein said actuator means comprises a handle disposed within a handle cup for pivotal movement relative



thereto, said connecting member being fixedly mounted to said handle, whereby said connecting member is rotated about its longitudinal axis in response to pivotal movement of said handle;

(e) wherein said handle is journalled within said handle cup by a bushing means; and wherein said connecting member is disposed within said bushing means and is connected to said handle.

4,880,262

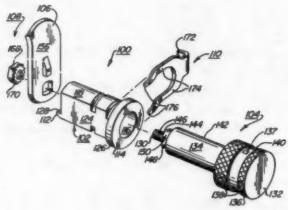
DOOR LATCH

Frank A. Mugnolo, 10616 Newbury, Westchester, Ill. 60153; Anthony Mugnolo, and Joseph A. Calabrese, both of Westchester, Ill., assignors to Frank A. Mugnolo, Westchester, Ill.

Filed Mar. 2, 1987, Ser. No. 20,567

Int. Cl.[4] E05C *3/04*

U.S. Cl. 292—202 **2 Claims**



1. A latch for securing a pivoting door, which door defines a door orifice including at least one orifice flat, to a door frame in the door closed position comprising:

a latch bushing which has the general shape of a hollow flanged cylinder having a bushing longitudinal inner end, a bushing longitudinal outer end, a bushing interior surface, and a bushing exterior surface, said bushing including a flange adjacent the bushing outer end which has a cross-sectional area which extends beyond the cross-sectional area of the door orifice, the bushing exterior surface extending longitudinally towards the bushing inner end which is generally cylindrical but includes at least one longitudinally extending planar surface adapted to bear against the door orifice flat, the exterior surface further defining a first longitudinally transverse groove longitudinally disposed towards the bushing inner end from the flange and a stop flat extending longitudinally to the bushing inner end, and the bushing interior surface extending longitudinally between the bushing inner end and the bushing outer end having a journal defined by a smooth cylindrical wall;

an operator which has the general shape of a stepped cylinder having an operator longitudinal inner end, an operator longitudinal outer end, and an operator exterior surface partially received within said bushing, said operator including a handle adjacent the operator longitudinal outer end which has a cross-sectional area which extends beyond the cross-section area of the interior surface at the axial outer end of said bushing, the handle including a manipulatable portion adapted to be grasped by fingers, said operator further including an attachment at the operator inner end and a bearing disposed between the handle and the attachment, the attachment having a connector portion at the operator inner end and at least one latch flat disposed between the connector portion and the bearing, the bearing having a smooth cylindrical surface, and the attachment having a cross-sectional area which is less than the minimum cross-sectional area of the interior surface of said bushing and the bearing diameter being slightly less than the diameter of the journal of said bushing to allow relative rotation between the bearing and the journal;

a striker, received on said operator, which is a generally elongate and flat body having a proximate end, a distal end, and an outer surface facing the operator longitudinal outer end, said striker defining near the proximal end an attachment orifice having at least one striker flat which is conformal with the latch flat of the attachment of said operator upon which said striker is disposed for preventing relative rotation between said operator and said striker, a stop, formed from material displaced from the body of said striker, adjacent the attachment orifice protruding from the striker outer surface towards the operator longitudinal outer end adapted to interfere with the stop flat of said bushing and limit the relative rotation between the journal portion of said bushing and the bearing of said operator, said stop being elongate and extending adjacent the axis of said striker towards the distal end for a predetermined distance between the attachment orifice and one-half the width of said bushing, the distal end of said striker extending far enough from the attachment orifice to be brought to bear against the door frame;

connector means adapted to interlock with the connector portion of said operator to secure said striker to said operator and bring the outer surface of said operator against the inner end of said bushing; and

securement means adapted to be partially received within the axially transverse groove of said bushing to restrain movement of said bushing in a direction towards the outer end of said bushing.

4,880,263

SWITCHING APPARATUS FOR VEHICLE LOCKING DEVICE

Shinjiro Yamada, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

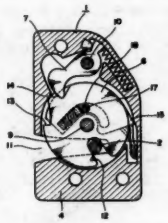
Filed Aug. 11, 1988, Ser. No. 230,969

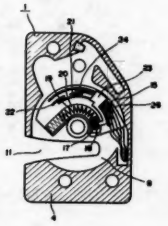
Int. Cl.[4] E05C *3/24*

U.S. Cl. 292—216 **1 Claim**

1. A switching apparatus for a vehicle locking device in which a recess portion **8** for receiving a latch **6** and a ratchet **7** for preventing the reversing of said latch is formed in a base plate **4** made of a synthetic resin so that said latch **6** and said ratchet **7** are mounted in said recess portion **8**, comprising a recess portion **25** for receiving a cartridge **15** which is provided at the back of said recess portion **8**, said cartridge **15** being provided with a half-latching fixed contact **21**, a fully-latching fixed contact **22** and an open-state fixed contact **26** which each have the form of a circular arc with a latch shaft **9** at the center of the arc, an arc-shaped inner groove **20**, a return spring **19** for reversing said latch which is received in said arc-shaped inner groove **20**, and a movable contact **23** which is brought into contact with each of said fixed contacts and

which has a boss 17 engaging with one end of said return spring 19 in said arc-shaped inner groove 20, said latch 6 being received in said recess 8 after said cartridge 15 has been received in said recess 25 so that a projection 18 projecting from said latch 6 is engaged with said boss 17 of said movable contact 23 of said cartridge 15.





4,880,264

LATCH DEVICE FOR INCLINABLE BACK REST CUSHION MOUNTED IN SEATBACK

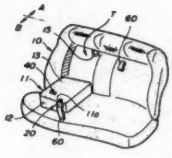
Hiroshi Yamazaki; Toshiyuki Hara, both of Yokohama; Yuji Tanaka, and Takayuki Mouri, both of Ayase, all of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase and Ohi Seisakusho Co., Ltd., Yokohama, both of, Japan

Filed Apr. 1, 1988, Ser. No. 176,506

Claims priority, application Japan, Apr. 3, 1987, 62-51262[U]

Int. Cl.[4] B60N *1/10*

U.S. Cl. 292—226 **19 Claims**



1. In a seatback having a back rest cushion inclinable in relation to a tunnel in the seatback,

a latch device for latching said back rest cushion to said seatback when said back rest cushion is snugly received in said tunnel, which comprises:

a striker secured to said seatback;

a first base member fixed to said back rest cushion to move therewith;

a latch member pivotally connected to said first base member and latchingly engageable with said striker when said back rest cushion is received in said tunnel;

a pull strap fixed to said latch member for pivoting said latch member in a direction to release said latch member from said striker when pulled in a given direction;

a lock member movably mounted to said first base member, said lock member being movable to a position to obstruct the pivoting of said latch member in the striker releasing direction;

a lock member actuating member movably mounted to said first base member, said actuating member moving said lock member away from the travelling path of said latch member when pushed by said striker;

a lock cancelling member movably mounted to said first base member for moving said latch member in the striker releasing direction when moved in a given direction by a given distance; and

means for manually moving both said lock member and said lock cancelling member from a back side of said back rest cushion.

4,880,265

ROBOT ARM WITH AN ASSEMBLY FLANGE FOR TOOLS

Peter Drexel, Steinenbronn; Hans Erne, Waiblingen; Gerhard Gosdowski, Bietigheim-Bissingen; Karl Gross, Schorndorf; Ulrich Kirsten, Gerlingen, and Ernst Leisner, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

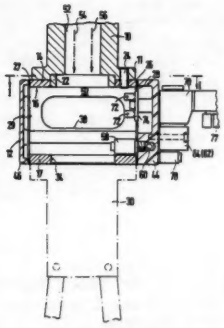
PCT No. PCT/DE87/00007, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/04653, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 10, 1987, Ser. No. 116,563

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602901; Apr. 25, 1986, 3613980

Int. Cl.[4] B25J *17/02*

U.S. Cl. 294—86.4 **13 Claims**



1. A robot arm comprising, a robot arm unit; and an assembly flange provided with means for centering and fastening of tools, said assembly flange being formed as a wall of a housing member fastened to said robot arm unit, said housing member having an interior space in which line portions for power supply and control on said robot arm unit can pass, said housing member having a plurality of sides and being provided on said sides with openings; a plurality of cover plates arranged to cover said openings, at least one of said cover plates being provided with internal connections for the line portions, and also being provided with means for manually connecting said internal connections with elements arranged outside said housing member, said at least one cover plate is provided with a joint pressure medium connection for a plurality of pressure medium line portions, said at least one cover plate being also provided with pressure medium valves located outside of said at least one cover plate, said at least one cover plate also hav-

ing a distributor duct through which said pressure medium valves are connected with at least one of said internal connections.

4,880,266

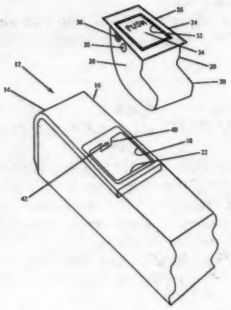
VEHICLE ASH TRAY

John N. Hoffman, 10450 Laramie Ave., Chatsworth, Calif. 91311, and Bruce J. Greenbaum, 177 S. Westgate Ave., Los Angeles, Calif. 90049

Filed Jul. 5, 1988, Ser. No. 215,350

Int. Cl.[4] B60N *3/12*

U.S. Cl. 296—37.9 **7 Claims**



1: A vehicle ash tray comprising:

a receptacle portion for receiving ashes and the like,

a cover member secured to the upper end of said receptacle member and having an edge projecting beyond the side wall of said receptacle to suspend said receptacle within the opening of a vehicle seat escutcheon, and

an insert member clamped between said cover member and the upper edge of said receptacle having a pair of legs projecting outwardly and downwardly outside of said receptacle and engageable with said escutcheon when said ash tray is inserted into the opening of said escutcheon to resiliently retain said ash tray in the desired position, (Said) said insert member (is) being generally Ushaped, having a crosspiece and having said legs pprojecting outwardly and downwardly from the upper edge of said crosspiece.

4,880,267

BACK DOOR STRUCTURE FOR A MOTOR VEHICLE

Takeji Ohya, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 16, 1987, Ser. No. 97,095

Claims priority, application Japan, Sep. 17, 1986, 61-218628; Sep. 17, 1986, 61-218629

Int. Cl.[4] B62D *25/10*

U.S. Cl. 296—56 **19 Claims**

1. A back door structure for a motor vehicle comprising:

a vehicle body having a rear pillar defining a back door opening of a trapezium configuration;

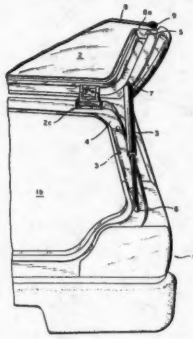
a back door hingedly mounted on an upper part of said vehicle body for movement between an open and a closed position;

said back door being of trapezium configuration with its lower portion wider than its upper portion and adapted in the closed position to cover and secure said back door opening;

a stay damper pivotally connected with said back door at one end and pivotally connected with a rear pillar of the vehicle body at its other end to bias said back door to a raised open position and being disposed between said rear pillar and said back door in the closed position of said back door;

said stay damper moving outwardly in accordance with the movement toward the open position of the back door;

said back door including a back door window glass, a frame member having a closed cross-section disposed along the inner surface of a side peripheral edge of the back window glass, an outer edge of the fame member being substantially disposed inside the outer edge of the back window glass, and a concealment member connected with said frame member and extending outwardly around the rear corners of the vehicle body to conceal both said stay damper and said rear pillar and to constitute a portion of the outer surface of said vehicle body;



said concealment member having a free end extending toward a side surface of said rear pillar and co-acting with a grill member to conceal said pillar.

4,880,268

FRONT SEAT FOR A MOTOR VEHICLE HAVING ONLY TWO SIDE DOORS

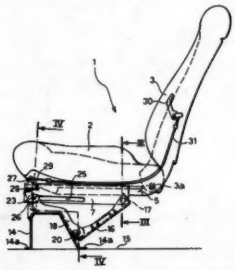
Silvio Brambilla, Turino, Italy, assignor to Sicam Societa' Italiana Cuscini A Molle S.p.A., Turino, Italy

Filed Apr. 28, 1988, Ser. No. 187,201

Claims priority, application Italy, Apr. 28, 1987, 53272/87[U]; Nov. 4, 1987, 67938; Nov. 4, 1987, 67939; Apr. 1, 1988, 67294

Int. Cl.[4] B60N *1/02*

U.S. Cl. 296—65.1 **25 Claims**



1. A front seat for a motor vehicle with only two side doors, comprising a frame (4) and means for connecting the frame (4) to the floor (15) of the motor vehicle which enables the seat to be moved between a normal operative position and an inoperative forward position in which access to the rear seats of the motor-vehicle is facilitated, the connecting means comprising

at least one pin-slot coupling (23, 25) operatively interposed between the seat frame (4) and the motor-vehicle floor (15) and further including guide means (5, 9) allowing the adjustment of the operative position of the seat longitudinally of the motor-vehicle,

characterised in that the seat further includes an auxiliary support structure (7) which supports the seat frame (4), in that said guide means allowing the adjustment of the operative position of the seat longitudinally of the motor-vehicle are operatively interposed between the seat frame (4) and the auxiliary support structure (7) and in that the pin-slot coupling (23, 25) is operatively interposed between the auxiliary support structure (7) and the motor-vehicle floor (15).

4,880,269

VEHICLE CAB WINDOWS

Svend Jensen, Randers, Denmark; David S. Paul, Windgather, and Michael Appleyard, Chorley, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jul. 5, 1988, Ser. No. 215,120

Claims priority, application United Kingdom, Jul. 7, 1987, 8715976

Int. Cl.[4] B62D *33/06*

U.S. Cl. 296—190 **9 Claims**

1. A vehicle cab having a window aperture closed by a pivotable glazing panel, the window aperture being of vertically tapering form such that the width of the lower regions of the aperture is less than higher regions of the aperture and the glazing panel is of similar vertically tapering form, and glazing panel mounting means which allows the glazing panel to be moved from a generally upright closed position to a generally horizontal open position by raising said panel in a vertical sense so that the lower narrower portion of the panel is in alignment with a portion of the aperture wider than itself and then pivoting the lower narrower portion of the glazing panel about a first generally horizontal axis through the wider portion of the aperture into its generally horizontal open position.

4,880,270

WORK STATION SYSTEM

Lloyd G. B. Cooper, 3825 Redmont Rd., Birmingham, Ala. 35213

Continuation-in-part of Ser. No. 934,970, Nov. 25, 1986, Pat. No. 4,779,922. This application Oct. 24, 1988, Ser. No. 261,525

Int. Cl.[4] A47C *7/62*

U.S. Cl. 297—188 **23 Claims**

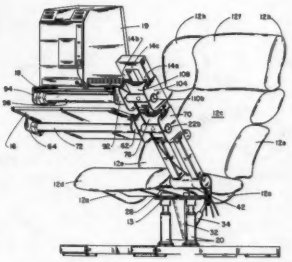
1. A work station comprising:

a chair for supporting a human operator in a seated position, said chair having means for supporting the thigh portion of a human and means for contacting a back portion of a human, said chair being rockable about a first horizontal axis;

a carriage;

a support surface upon which a first device is supportable, said device-supporting surface being attached to said carriage; and,

carriage attaching means for attaching said carriage to said chair, said carriage attaching means including a position setting means for pivoting said carriage about a second horizontal axis whereby said carriage pivots toward or



away from said back portion of said chair, and whereby once said carriage is positioned towards said back portion of said chair, the spatial distance between an operator seated in said chair and said device supporting surface remains essentially constant in a relationship determined by said position setting means as said chair is rocked about said first horizontal axis.

4,880,271

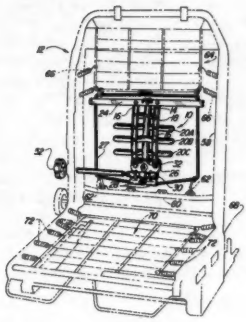
ADJUSTABLE LUMBAR SUPPORT

Lee K. Graves, Bloomfield, Mich., assignor to Wickes Manufacturing Company, Southfield, Mich.

Continuation of Ser. No. 137,905, Dec. 28, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 289,539

Int. Cl.[4] A47C *7/46*

U.S. Cl. 257—284 **3 Claims**



1. An adjustable lumbar-support for a vehicle seat comprising a top support member, a bottom support member, a vertically-extending convex flexible band secured to both support members and having a resilience opposing increasing convexity, means for adjusting the distance between the supports to vary the convexity of the flexible band, and spring means interconnecting the supports to bias the flexible band toward increasing convexity in opposition to the resilience of the flexible band, characterized by the adjusting means including a second flexible band affixed to one of the support members and movably mounted on the other support member.

4,880,272

SEAT FURNITURE

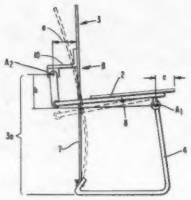
Egon Bräuning, Weil am Rhein, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands

Filed Jun. 3, 1988, Ser. No. 202,222

Claims priority, application Switzerland, Jun. 9, 1987, 2161/87

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—296 9 Claims



1. Seat furniture, comprising a stand having a forward section, a rearward section and a first pivot axis located on said forward section at a first elevation; a seat having a front end and a back end; a backrest having an upper end, a lower end fixedly attached to said rearward section of said stand, a front side facing toward said seat, a back side facing away from said seat, and an elastically resilient portion extending from said lower end of said backrest to a point on said backrest located at a second elevation which is higher than said first elevation, said backrest being arranged in a rest position in which said backrest is oriented substantially vertically and said backrest being deflectable out of its said rest position in response to a force exerted against said front face of said backrest by an individual sitting on said seat; connecting means movably mounted on said forward section of said stand for connecting said seat to said backrest in such a manner that said back end of said seat pivots downwardly in response to the deflection of said upper end of said backrest away from said forward section of said stand, said connecting means including an angular linkage extending between said first pivot axis and a second pivot axis positioned adjacent to said back face of said backrest at a third elevation which is higher than said first elevation but no higher than said second elevation, whereby said elastically resilient portion of said backrest is located below said second pivot axis, said linkage including a first end which supports said front end of said seat and which is pivotable about said first pivot axis and a second end which is pivotable about said second pivot axis; and supporting means fixedly attached to said back face of said backrest for supporting said second end of said linkage, said supporting means including said second pivot axis, whereby said second end of said linkage is pivotally connected to said supporting means in such a manner that said second end of said linkage pivots about said second pivot axis as said first end of said linkage pivots about said first pivot axis to thereby permit the synchronous movement of said backrest and said seat.

4,880,273

RECLINING CHAIR HAVING SUSPENDED SEATING

Isidoro N. Markus, 65-36 99th St. (1E), Rego Park, N.Y. 11374

Continuation-in-part of Ser. No. 217,823, Jul. 12, 1988, Pat. No. 4,819,986. This application Jan. 23, 1989, Ser. No. 300,576

Int. Cl.[4] A47C *1/02*

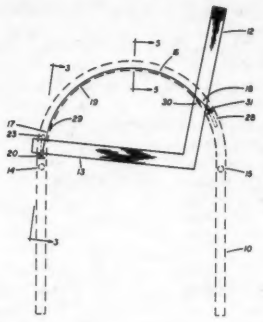
U.S. Cl. 297—325 7 Claims

1. A reclining chair comprising:

a frame having on opposite sides substantially vertical members connected to each other;

a seating disposed within said frame and comprising a seat board and a back board; and,

means for supporting said seating including (1) a flexible strap member connected at its ends to said seating and (2)



a fixed raceway disposed between said vertical members, said flexible strap sliding over said raceway.

4,880,274

POWER RECLINING DEVICE OF SEAT

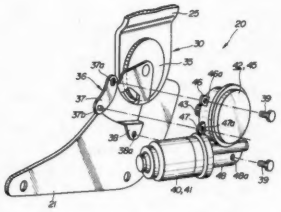
Kenji Ichikawa, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 2, 1988, Ser. No. 202,010

Claims priority, application Japan, Jul. 31, 1987, 62-117858[U]

Int. Cl.[4] A47C *1/025*

U.S. Cl. 297—362 5 Claims



1. In a seat having a seat cushion and a seatback which is pivotal relative to said seat cushion,

a power reclining device comprising:

a base plate secured to said seat cushion;

a pivoting arm secured to said seatback, said pivoting arm being pivotally connected to said base plate;

a reduction gear mechanism arranged between said base plate and said pivoting arm, said reduction gear mechanism pivoting said pivoting arm at a reduced speed when actuated;

an electric motor unit for actuating said reduction gear mechanism when electrically energized;

connecting means for detachably connecting said electric motor unit to a given portion of said base plate; and

positioning means for positioning said electric motor unit with respect to said given portion of said base plate before connecting said electric motor unit to said base plate,

wherein said positioning means comprises a mounting plate which is formed with two threaded openings and a positioning pin, and three separate portions formed on said electric motor unit and having respective openings which are mated with said two threaded openings and said positioning pin respectively upon proper mounting of said electric motor unit to said base plate.

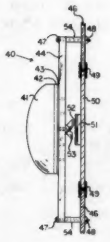
4,880,275
COMBINATION HEADREST AND WALL WITH SLIDING WINDOW

Michael A. Lanteri, 39 Wayhill Rd., W., Waterford, Conn. 06385

Continuation-in-part of Ser. No. 928,823, Nov. 10, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 120,715

Int. Cl.[4] A47C *1/10*

U.S. Cl. 297—391 **2 Claims**



1. The combination of a headrest assembly means and a cab including a rear wall having therein a sliding window assembly of a predetermined vertical dimension and projecting a predetermined horizontal dimension forwardly of said wall, said headrest assembly including first and second support bars each having an upper end and a lower end and a longitudinal dimension greater than said predetermined vertical dimension, and first, second, third and fourth spacer means, each secured to and projecting forwardly of said wall and of a length greater than said predetermined horizontal dimension, said first, second, third and fourth spacer means secured to said upper end of said first support bar, said lower end of said first support bar, said upper end of said second support bar and said lower end of said second support bar, respectively, thus to allow unobstructed sliding movement of said window assembly.

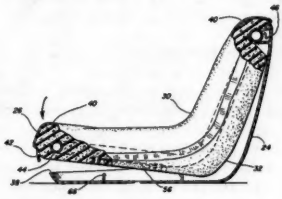
4,880,276
SEAT ASSEMBLY

John S. Shovar, Davenport, Iowa, assignor to Sears Manufacturing Company, Davenport, Iowa

Continuation-in-part of Ser. No. 152,108, Dec. 20, 1988, Pat. No. 4,792,189. This application Dec. 19, 1988, Ser. No. 286,470

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—452 **5 Claims**



1. A neat assembly, comprising:

a foam cushion assembly including a foam cushion and a generally rigid internal framework molded integrally within said cushion, said cushion having front, back and side portions and a lip extending around said side portion, said framework being located within said cushion in sufficient proximity to said side portion and said lip to substantially maintain predetermined manufacturing tolerance of said side portion and said cushion lip;

a rigid shell attachable to the back portion of said cushion, said shell having a peripheral edge configured to substantially uniformly mate with said cushion lip;

a cover overlying the front portion of said cushion and having a free peripheral section extending between said cushion lip and said shell edge; and

means to attach said shell to said foam cushion, including means to fasten said shell to said internal framework.

4,880,277
ON-VEHICLE AUXILIARY SEAT FOR INFANT

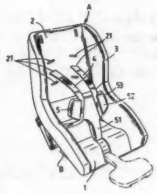
Takehiko Takahashi; Hideo Saito; Takashi Watanabe, and Tomihiro Kaneko, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,305

Claims priority, application Japan, Oct. 2, 1987, 62-151467[U]; Oct. 2, 1987, 62-151468[U]; Oct. 23, 1987, 62-162040[U]; Oct. 30, 1987, 62-166370[U]

Int. Cl.[4] B60R *21/00*

U.S. Cl. 297—467 **15 Claims**



1. An infant auxiliary seat in a vehicle comprising:

an auxiliary seat body having a seat floor and a seat back;

a pair of infant-arresting belts extending through said seat back, and having first ends attached to a retracting/-projecting mechanism and second ends attached directly to said floor of said auxiliary seat body; and

a belt-stop mechanism pivotably attached to a central portion of a front surface of said seat floor so as to be capable of being erected and prostrated, said pair of infant-arresting belts being provided to be freely fastened to said belt-stop mechanism at respective longitudinally middle portions of said infant-arresting belts.

4,880,278
CUTTING TOOL FOR A MINING MACHINE

Peter N. Tomlinson, 315 Enford Road, Mondeor, Transvaal, South Africa

Filed Dec. 18, 1987, Ser. No. 134,925

Claims priority, application South Africa, Dec. 19, 1986, 86/9564

Int. Cl.[4] E21C *35/18*; E21B *10/46*

U.S. Cl. 299—79 **4 Claims**

1. A cutting tool for a mining machine, comprising a holding

lug for connecting the tool to the mining machine, and including a first end portion defining a top frusto-conical tapered surface having an upper edge within which is located a socket; and a tool component including:

(a) a cemented carbide stud including a bottom portion, a top frusto-conical portion having a top recess, and a central portion spacing the top portion from the bottom portion,

(b) the bottom portion and the whole of the central portion being secured within the socket to connect the tool component to the holding lug,

(c) the top frusto-conical portion lying wholly and entirely within a space bounded by an imaginary upward continuation of the top frusto-conical tapered surface of the holding lug, continuing upwardly from the upper edge of the first end portion of the holding lug, and

(d) a composite abrasive compact or abrasive compact secured within the top recess, extending outward therefrom and forming an abrasive compact surface, the periphery of which provides a cutting edge.

4,880,279

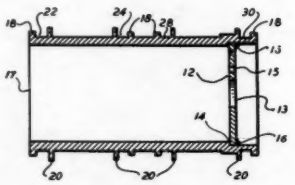
MODEL AUTOMOBILE RIM CONSTRUCTION

Fred Flesche, 204 Barnes Rd., Washingtonville, N.Y. 10992

Filed Nov. 25, 1987, Ser. No. 125,198

Int. Cl.[4] B60B *11/04*

U.S. Cl. 301—36 R **6 Claims**



1. A dual wheel for supporting two tires in parallel relationship, comprising:

a unitary integral cylindrical rim body having at least four pairs of flanges, each flange extending radially outwardly from the exterior of said rim body in parallel relationship, each said flange pair defining therebetween a space for receiving the bead of a tire, whereby at least two tires can be mounted in parallel thereon; said body being open at one end, and having near the other end a transverse web; and means secured to said web for enabling said web to be secured to an end of a vehicle axle.

4,880,280

MOTORCYCLE WHEEL HUB AND FLANGE ASSEMBLY

Ignatius J. Panzica, and Herbert W. Hoeptner, both of Morgan Hill, Calif., assignors to Custom Chrome, Inc., Morgan Hill, Calif.

Filed Jun. 27, 1988, Ser. No. 211,917

Int. Cl.[4] B06B *27/02*

U.S. Cl. 301—105 B **9 Claims**

1. In a hub and flange unit for a spoked motorcycle wheel, associated wit a motorcycle frame having forks, the combination comprising

(a) an axle and a tubular hub defining an axis and axiallyn receiving the axle,

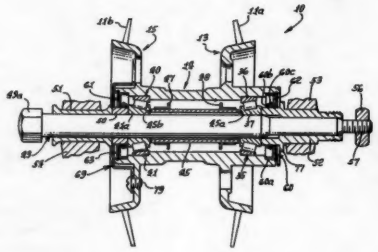
(b) two flanges rigidly mounted on the hub, said flanges having inner annular portions extending generally radially, and outer annular portions that extend angularly axially and radially, said outer portions defining holes spaces about said axis to receive spokes,

(c) the hub having opposite end portions and defining a bore between said end portions, first counterbores at said respective end portions, and second counterbores at said respective end portions, each first counterbore located between the bore and a second counterbore,

(d) a bearing assembly located in each first counterbore, each said assembly including an annular outer race fittingly received axially by its respective first counterbore, an annular inner race spaced radially inwardly of the outer race, and rollers retained between said races,

(e) a first tubular spacer located within said bore and having opposite ends respectively engageable with the inner races to position said inner races in axially spaces apart relation,

(f) the tubular spacer and said inner races received on said axle and mounted thereon, there being other annular



spacers that are received on the axle and that urge the inner races toward the first tubular spacer, and the axle projecting endwise externally of the hub to carry said forks defined by the motorcycle frame,

(g) annular seal means removably received in said second counterbores, and retainer means removably mounted on the hub for retaining said seal means in position in said second counterbores,

(h) whereby said bearing assemblies are easily endwise removable from the hub after removal from the hub of said axle, said other annular spacers, said retainer means, and said seal means, for replacement thereof.

4,880,281

WHEEL BEARING

Boy Merkelbach, Utrecht, Netherlands, assignor to SKF Industrial Trading & Development Co. B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 866,475, May 23, 1986, abandoned, which is a continuation of Ser. No. 664,168, Oct. 24, 1986, Pat. No. 4,621,700. This application Aug. 4, 1988, Ser. No. 230,240

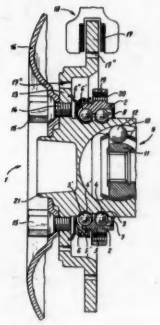
Claims priority, application Netherlands, Dec. 8, 1983, 8304240

Int. Cl.[4] F16C *33/58, 33/64*

U.S. Cl. 301—124 R **2 Claims**

1. A wheel bearing device with a built-in homokinetic coupling having an outer ring, including a generally annular inner part having inside running surfaces, an outer race having outside running surfaces and two rows of rolling elements located between said outside running surfaces and said inside running surfaces, whereby the outer race is equipped with a radially extending flange for the attachment of the bearing, and the annular inner part is equipped with a radially extending flange to which the hub of a wheel can be attached, and whereby the inner part forms at the same time one unit with said outer ring of the homokinetic coupling characterized by the fact that the flange (13,13') of the inner part (1,1') is extended with a brake element (17,17'') which forms the part to be braked of a braking mechanism (18,18') and said inner part having an axial stub (21,21') directed away from the homokinetic coupling (9,9') and extending beyond the attachment flange (13,13') to define a guide means for the hub (16,16') of the wheel, so that the inner part (1,1') of the bearing, the carrier flange (13,13') for

the wheel, the brake element (17,17') and the outer ring (10,10') of the homokinetic coupling (9,9') and the axial stub (21,21') forms one homogeneous unit manufactured from a material



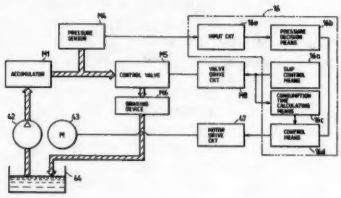
unsuitable for bearing use, the inner raceway surfaces being formed by coating said surface with a high grade material which is then hardened by induction hardening.

4,880,282

BRAKING SYSTEM WITH APPARATUS FOR CONTROLLING PRESSURE TO BE ACCUMULATED IN ACCUMULATOR FOR BRAKING MOTOR VEHICLE

Nobuhiko Makino, Kariya; Kimio Tamura, Anjo; Hiroharu Miyazaki, Toyota; Tomohiko Hosoda, Nagoya, and Fumio Nakagawa, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 238,234, Aug. 30, 1988, abandoned.
This application Apr. 12, 1989, Ser. No. 344,480
Claims priority, application Japan, Aug. 30, 1987, 62-217719; Jun. 2, 1988, 63-135984
Int. Cl.[4] B60T *8/32, 8/44*
U.S. Cl. 303—116 **15 Claims**



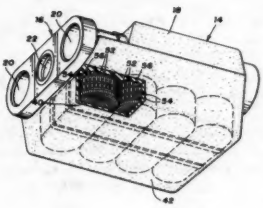
1. A braking system for use in a motor vehicle, comprising:
accumulator means coupled to motor-driven pump means for accumulating a hydraulic pressure which is supplied to a braking device to brake a wheel of said motor vehicle;
control valve means provided between said accumulator means and said braking device for regulating the hydraulic pressure to be applied from said accumulator to said braking device; and
control means for controlling said control valve means so as to regulate the hydraulic pressure to said braking device, said control means controlling said motor-driven pump means on the basis of the control time of said control valve means.

4,880,283

COMPOSITE TREAD FOR TRACK-LAYING VEHICLES

Russell C. Savage; Gary P. Zeller, and Martin D. Skirha, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1988, Ser. No. 141,965
Int. Cl.[4] B62D *55/20*
U.S. Cl. 305—35 R **7 Claims**



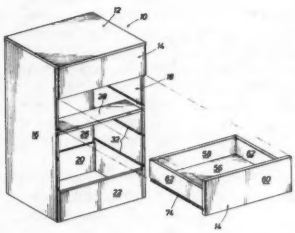
5. A composite tread member having a wear surface for use in a track for a track-laying vehicle comprising a metal support member embedded in an abrasion resistant fiber reinforced polymeric material,
said reinforcing fibers being arranged in bundles and oriented lengthwise in an about perpendicular relationship to said wear surface of said tread member.

4,880,284

CHEST OF DRAWERS AND METHOD OF ASSEMBLY

James E. Dickson, and Dario Vasquez, Jr., both of Pearland, Tex., assignors to Wholesale Furniture Distributors, Inc., Houston, Tex.

Filed Jan. 9, 1989, Ser. No. 294,354
Int. Cl.[4] A47B *43/00*
U.S. Cl. 312—263 **10 Claims**



1. A method for manually assemblying a plurality of drawers from a plurality of flat panels with the assembled drawers adapted to be received in sliding supporting relation within a plurality of vertically spaced pairs of opposed horizontal grooves in spaced parallel vertical sides of a frame for a chest of drawers;
said method comprising the following assembly steps for each of said drawers:
providing a flat bottom panel;
providing vertically extending front and back panels with a horizontal groove to form a pair of opposed horizontal grooves;
mounting said flat bottom panel within said opposed horizontal grooves of said vertically extending front and rear panels with side marginal portions of said bottom panel extending laterally outwardly beyond the ends of said rear panel to form projecting side supporting flanges; and
connecting a pair of vertical side panels to said front and back panels at mating interlocking joints adjacent the ends

of said front and back panels with the lower edges of said side panels supported on the upper surface of said bottom panel inwardly of said projecting side supporting flanges whereby said drawer may be positioned within a frame for a chest of drawers and wholly supported in sliding relation on said projecting flanges received within a pair of said opposed horizontal grooves of said frame

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4,880,285

COLLAPSIBLE SUPPORTING DEVICE FOR SUPPORTING A VERTICALLY ADJUSTABLE LIFTING PLATFORM IN A DISPLAY CONTAINER, AND DISPLAY CONTAINER PROVIDED WITH SUCH A DEVICE

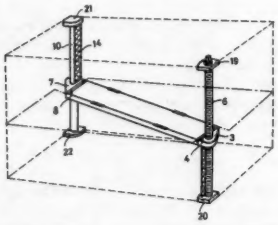
Gerardus C. Brinkers, Duinvoetlaan 20, 2243 CL Wassenaar, Netherlands

Filed Jun. 12, 1987, Ser. No. 62,507

Claims priority, application Netherlands, Jun. 12, 1986, 8601528; Sep. 11, 1986, 8602296; Dec. 23, 1986, 8603281

Int. Cl.[4] A47B *51/00*

U.S. Cl. 312—312 **13 Claims**



1. A supporting device for supporting a vertically adjustable lifting platform in a container for the transportation, temporary storage and display and presentation of products such as packed foods, the lifting platform being adapted for carrying the products, said supporting device comprising:

a supporting bar for directly supporting a vertically adjustable lifting platform in a container, said lifting platform being adapted for carrying products thereon;

a lifting device cooperating with said supporting bar for effecting vertical displacement of said supporting bar when said support device is in said container;

a hinge means connecting said supporting bar to said lifting device such that said supporting bar and lifting device are foldable against one another; and

said supporting device forming a separate, foldable unit that fits inside a casing formed by the container.

4,880,286

MAKING A HOLOGRAPHIC OPTICAL ELEMENT USING A COMPUTER-GENERATED-HOLOGRAM

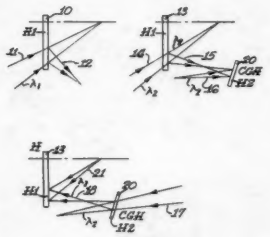
Charles C. Ih, Newark, Del., assignor to University of Delaware, Newark, Del.

Filed Oct. 19, 1987, Ser. No. 110,128

Int. Cl.[4] G03H *1/08;* G02B *1/20*

U.S. Cl. 350—1.1 **1 Claim**

1. A method of producing a high resolution infrared hologram with the aid of a digital computer comprising defining mathematically a final infrared hologram by specifying mathematically a first object beam and a first reference beam at a fist wavelength, determining a computer generated hologram (CGH) by calculating a reconstructed wavefront from said mathematically defined IR hologram at a second wavelength by computer calculation using the Welford equation, interfering mathematically said reconstructed wavefront with a second reference beam to determine said CGH by computer calculations at said second wavelength, physically implementing the determined CGH, and then reconstructing by a reconstruction beam at the second wavelength and conjugate to the second reference beam, creating a distorted wavefront, and making the said final IR hologram by mixing said reconstruc-



tion wavefront with a beam conjugate to said first reference beam at said second wavelength.

4,880,287

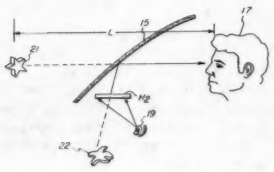
COMPLEX CONJUGATE HOLOGRAM DISPLAY

Gaylord E. Moss, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 6, 1987, Ser. No. 792

Int. Cl.[4] G03H *1/22;* G02B *27/14*

U.S. Cl. 350—3.85 **9 Claims**



5. A hologram made according to the steps of:

making a first hologram of an object at a distance L from an observer recording the virtual image of the object;

making a second hologram by illuminating the first hologram with its conjugate reference beam and reflecting the light from said first hologram off a warped combiner means and onto a second hologram plate; and

illuminating the second hologram plate with a reference beam passed through said warped combiner means.

4,880,288

INTEGRATED OPTICAL WAVEGUIDE, METHOD FOR ITS MANUFACTURE, AND ITS USE IN AN ELECTRO-OPTICAL MODULATOR

Sylvie Vatoux, St Remy Les Chevreuses; Michel Papuchon, Massy, and Hervé Lefevre, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed May 3, 1988, Ser. No. 189,705

Claims priority, application France, May 4, 1987, 87 06247

Int. Cl.[4] G02B *6/10;* H01L *21/265*

U.S. Cl. 350—96.12 **11 Claims**

1. A lateral confinement integrated optical waveguide comprising:

a lithium niobate substrate with at least one central zone, a dopant material formed as a strip for doping said substrate with an appropriate dopant having a refractive index greater than that of the substrate and such that said strip extends along the surface of the crystal according to the desired configuration,

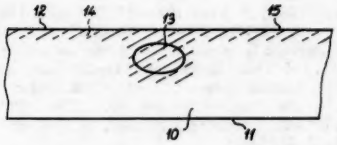
a film of dopant material placed such that it flanks said central zone by lateral zones so that these lateral zones are

doped with the same dopant as the desired configuration but in smaller concentrations, such that a guided wave can be propagated in the central zone.

5. A method for manufacturing a waveguide comprising:

the steps of forming a lithium niobate substrate, with at least one central zone;

doping with an appropriate dopant having a reflective index greater than that of the substrate, on said substrate, and



wherein said dopant extends along the surface of the crystal according to a desired configuration and wherein a central zone is obtained by diffusion of a strip of dopant deposited on the surface of the substrate and wherein lateral zones are obtained by diffusing a film of dopant with a smaller thickness than that of the strip and in a smaller concentration, such that guided waves are propagated in said central zone.

4,880,289

TWO-WAY OPTICAL TRANSMISSION SYSTEM

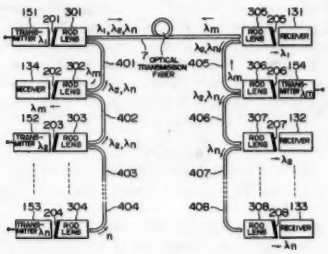
Katsuyuki Imoto, Sayama; Akihiko Takase, Koganei; Atsushi Takai, Kodaira; Satoshi Aoki, Chigasaki; Tsutomu Yoshiya, Yokohama, and Shoji Yamada, Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,311

Claims priority, application Japan, Dec. 16, 1983, 58-236159; Mar. 23, 1984, 59-54233; Mar. 29, 1984, 59-61865; Mar. 30, 1984, 59-60675

Int. Cl.[4] G02B 6/32

U.S. Cl. 350—96.18 **20 Claims**



20. A two-way optical transmission system in which a plurality of light signals of wavelengths differing one from another are transmitted through a single optical fiber from one end thereof to the other end and from said other end to said one end, comprising:

n (where n represents a natural number) first combined units each comprising optical transmitter means for outputting a light signal of wavelength λ_i (i=1, 2, . . . or n), a dielectric thin-film filter for transmitting therethrough the light signal of the wavelength λ_i and reflecting the light signals of the other wavelengths and a rod lens for introducing the light signal transmitted through or reflected by said dielectric thin-film filter into an optical fiber;

m (where m is a natural number) second combined units each comprising optical transmitter means for outputting a light signal of wavelength λ_j (j=1, 2, . . . or m), a dielectric thin-film filter for transmitting therethrough the light signal of the wavelength λ_j and reflecting light signals of the other wavelengths and a rod lens for introducing the light signal transmitted through or reflected by said dielectric thin-film filter into an optical fiber;

n third combined units each comprising a rod lens for fetching the light signal of the wavelength λ_i from the optical fiber, a dielectric thin-film filter for transmitting therethrough the light signal of the wavelength λ_i and reflecting the light signals of the other wavelengths and optical receiver means for receiving the light signal of the wavelength λ_i transmitted through said dielectric thin-film filter;

m fourth combined units each comprising a rod lens for fetching the light signal of the wavelength λ_j from the optical fiber, a dielectric thin-film filter for transmitting therethrough the light signal of the wavelength λ_j and reflecting the light signals of the other wavelengths, and an optical receiver means for receiving the light signal of the wavelength λ_j transmitted through said dielectric thin-film filter;

wherein said n first combined units and said m fourth combined units are disposed on the side of the one end of said single optical fiber,one end of a given one of said rod lenses of said first and fourth combined units facing one end of said single optical fiber, and the rod lenses of said first and said fourth combined units are connected in cascade through optical fibers;

said m second combined units and said n third combined units being disposed on the side of the other end of said single optical fiber, one end of a given one of said second and third combined units facing the one end of said single optical fiber, and the rod lenses of said second and third combined units being connected in cascade through optical fibers;

wherein each of said transmitter means has a light emission element and a spherical lens, each of said dielectric thin-film filters is provided with an angle at an end face of the corresponding rod lens which is located on the entrance side of light emitted by the light emission element, the length of each of said rod lenses is about n/4 pitch (where n=1, 3, 5, . . .), and each of said transmitter means and the corresponding filter and rod lens are integrally assembled in a single receptacle to thereby constitute an optical module.

4,880,290

OPTO-ELECTRONIC DEVICE AND METHOD FOR PRODUCING THE DEVICE

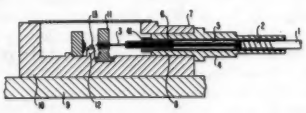
Tetsuo Kumazawa, Ibaraki; Makoto Shimaoka, Ushiku; Kazuyuki Fukuda, Ibaraki, and Eiichi Adachi, Mitaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 99,072

Claims priority, application Japan, Sep. 19, 1986, 61-219526

Int. Cl.[4] G02B 6/42

U.S. Cl. 350—96.20 **27 Claims**



1. An opto-electronic device comprising:

a package containing at least one optical component therein;

an optical fiber jacket guide penetrating and fixed to a wall of the package for enabling an optical fiber to pass into or out of the package;

an optical fiber core extending through the optical fiber jacket guide and positioned within the package so that an end thereof is optically coupled with the at least one optical component within the package;

a coating material coated on at least a portion of the optical

fiber core extending through the optical fiber jacket guide, the coating material within at least a portion of the optical fiber jacket guide having means for relieving strain of the coating material, the strain relieving means including a grooved peripheral surface of the coating material; and

means filling the region between the coating material and the optical fiber jacket guide within the optical fiber jacket guide for effecting bonding thereof;

whereby the grooved peripheral surface of the coating material within the optical fiber jacket guide substantially prevents contraction of the coating material in response to heat and cooling temperature cyclic variations and displacement of the optical fiber core within the package so as to maintain proper optical coupling of the end of the optical fiber core with the at least one optical component.

4,880,291

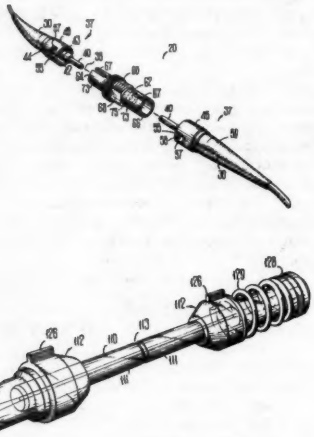
OPTICAL FIBER CONNECTOR AND METHODS OF MAKING

James A. Aberson, Jr., Atlanta; George F. DeVeau, Stone Mountain, and Kenneth M. Yasinski, Ellenwood, all of Ga., assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 4, 1988, Ser. No. 152,279

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **23 Claims**



1. An optical fiber connector, which comprises:

first and second plugs, each plug having an outer surface and a passageway therethrough for receiving an end portion of an optical fiber and each said passageway having a cross section transverse to a longitudinal axis of the plug which is significantly larger than that of the optical fiber to be received therein, each of said plugs comprising a segment of tubular stock with the segments of the tubular stock for said first and second plugs having been contiguous portions of the tubular stock and such that contiguous end faces of the two segments which have become said first and second plugs become adjacent free end faces of said first and second plugs;

a first optical fiber having an end portion which is received in the passageway of said first plug and a second optical fiber having an end portion which is received in the passageway of said second plug, each of said fiber end portions being disposed in an associated passageway of an associated plug intentionally in the same orientation with respect to the associated passageway of the associated plug; and

alignment means for maintaining the outer surface of said first plug aligned with the outer surface of said second plug and for causing the first and second plugs to have the same orientation with respect to each other as existed prior to separation from the tubular stock.

4,880,292

TRANSMISSION VIEWING SCREEN OF IMAGE PROJECTOR APPARATUS

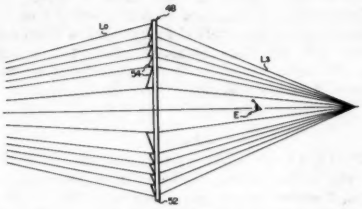
Hitoshi Kageyama; Toshikazu Suzuki; Keijiro Sakamoto; Tetsuo Kyogoku, and Masayuki Nino, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1988, Ser. No. 222,797

Claims priority, application Japan, Jul. 24, 1987, 62-186105; Jul. 31, 1987, 62-193376

Int. Cl.[4] G03B *21/60*

U.S. Cl. 350—128 **51 Claims**



1. A light-transmission viewing screen for displaying an optical image from a beam of light projected thereon along a predetermined path of light provided rearwardly of the screen, the viewing screen having a virtual center axis extending toward a viewer's viewing position, said light-transission viewing screen comprising

(a) a transparent or translucent transmission screen plate through which to transmit said beam of light, and

(b) a transmission grating located on at least a portion of one of said surfaces of the transmission screen plate for diffracting the beam of light toward a location substantially aligned with the virtual center axis of the viewing screen.

4,880,293

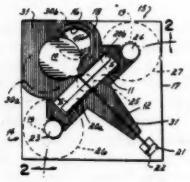
OPTIC FIBER SHUTTER APPARATUS

B. David Gilliland, III, Memphis, Tenn., assignor to DRD, Ltd., Memphis, Tenn.

Continuation of Ser. No. 694,289, Jan. 24, 1985, Pat. No. 4,778,254, and a continuation-in-part of Ser. No. 545,658, Oct. 26, 1983, abandoned. This application Apr. 26, 1988, Ser. No. 186,188

Int. Cl.[4] G02B *26/02*; G03B *27/72*

U.S. Cl. 350—269 **12 Claims**



1. A shutter apparatus, comprising:

a shutter blade movable between two spaced apart end positions,

a movable member carrying the shutter blade between the end positions for selectively covering a light aperture,

permanent magnetic material carried by the movable member, and

an electromagnetic system having means for attracting and repelling the permanent magnetic material for movement of the shutter blade between the two end positions, the electromagnetic system being comprised of an E-shaped ferromagnetic pole piece, the outer poles of the pole piece forming cores having an electrically conductive winding thereon and thereby forming the first and second electromagnets which are spaced from and respectively on opposite sides of the permanent magnetic material, a portion of the core of each electromagnet so formed extending into the path of the permanent magnetic material and defining a respective end stop, the middle pole being equidistant from the two end poles and having its free end spaced from the plane of the path of movement of the permanent magnetic material, the selective operation of the electomagnetic system causing the permanent magnetic material to move and engage and come to rest in a stable position against one or the other of two spaced apart stops which determine the two end positions of the shutter blade, or causing the permanent magnetic material to maintain a third stable position between the two end stops, whereby the shutter blade has three stable positions corresponding to full, partial and no shuttering of the aperture.

4,880,294

CONTINUOUSLY VARIABLE MICRODIAPHRAGM

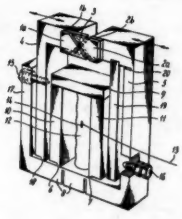
Godefridus J. Brakenhoff, Amsterdam, Netherlands, assignor to Stitchting Voor De Techische Wetenschappen, GA Utrecht, Netherlands

Filed Feb. 24, 1988, Ser. No. 159,696

Claims priority, application Netherlands, Feb. 27, 1987, 8700496

Int. Cl.[4] G02B *26/02, 26/00, 9/42*

U.S. Cl. 350—269 **13 Claims**



1. A microdiaphragm having an adjustable aperture between 0.5 and 1,000 μm comprising:

a pair of separate diaphragm strips, each of said diaphragm strips comprising two plates, each of which has a slanting end edge, said plates being fastened to each other so that their end edges lie behind each other and always forming a V-shaped recess, said recesses forming a lozenge-shaped opening,

transmission legs, each of said diphragm strips being fixed to or forming part of one of said legs, and

means, coupled to said transmission legs, for shifting said transmissions legs symetrically relative to one another.

4,880,295

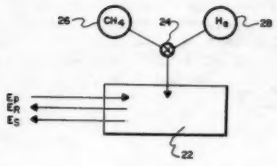
OPTICAL DEVICE ENHANCEMENT METHOD AND APPARATUS BY CONTROL OF STIMULATED BRILLOUIN SCATTERING GAIN

David A. Rockwell; Metin S. Mangir, both of Santa Monica; Jeffrey O. White, Malibu, and Dennis C. Jones, Westchester, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 21, 1987, Ser. No. 111,941

Int. Cl.[4] G02F *1/00*

U.S. Cl. 350—354 **30 Claims**



11. A method of establishing a gain medium for a stimulated Raman scattering (SRS) optical device which operates upon an input variable intensity optical beam to produce an output optical beam whose wavelength is shifted with respect to the wavelength of the input beam, said SRS being subject to dominance by stimulated Brillouin scattering (SBS), comprising:

selecting a first intensity level for said input variable intensity optical beam;

selecting a gain medium whose initial SBS gain coefficient is sufficiently low to avoid SBS dominance of SRS in said gain medium at said intensity level;

increasing the intensity level to at least a second intensity level at which said initial SBS gain coefficient is not sufficiently low to avoid SBS dominance over SRS, and

modifying said gain medium responsively to the increase in the intensity level, to establish SRS dominance over SBS at said second level.

4,880,296

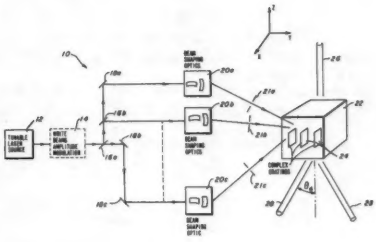
OPTO-OPTICAL BEAN DEFLECTOR, MODULATOR, AND SHAPER

L. Samuel Ditman, Jr., Westminster, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 4, 1987, Ser. No. 57,994

Int. Cl.[4] G02F *1/01*

U.S. Cl. 350—354 **11 Claims**



1. An optical beam deflector comprising:

a bulk optical material having aniosotropic light transmissive characteristics,

a tunable laser,

beam splitting means for splitting the light beam outputted from the laser into two or more beams, and

means for focusing each of the split light beams into the bulk optical material, each of the split light beams being focused in a predetermined relationship to each of the other split light beams so as to form a Raman-Nath diffraction grating within the optical material for deflecting a beam of light incident to the grating.

4,880,297

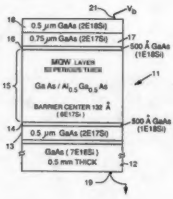
QUANTUM WELL OPTICAL ELECTRIC FIELD BIASED NONLINEAR METHOD AND APPARATUS

Martin M. Fejer, Menlo Park, and Robert L. Byer, Stanford, both of Calif., assignors to Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Filed Oct. 15, 1987, Ser. No. 109,054

Int. Cl.[4] G02F *1/015*

U.S. Cl. 350—355 **11 Claims**



1. In a method for producing second order, three-wave radiation interaction, the steps of:

providing a quantum well material which is substantially optically transparent to said radiation and includes free carriers within the same;

applying an electric field to said quantum well material to produce a quadratic nonlinear optical susceptibility whose sign depends on the direction of the applied electric field; and

introducing radiation for said second order interaction into that portion of said quantum well material having said quadratic nonlinear optical susceptibility.

means for introducing optical wave energy into said one portion for optical interaction with said quantum well material; and

means for producing a quadratic nonlinear optical susceptibility in said one portion of said quantum well material for said optical wave energy by applying an electric bias field across said one portion of said material, the sign of said susceptibility depending on the direction of the applied electric bias field.

4,880,298

MICROSCOPE OBJECTIVE

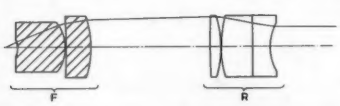
Katsuhiro Takada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 893,172, Aug. 5, 1986, abandoned. This application Jan. 20, 1988, Ser. No. 146,044

Claims priority, application Japan, Aug. 7, 1985, 60-173870

Int. Cl.[4] G02B *21/02*

U.S. Cl. 350—414 **50 Claims**



1. A microscope objective lens system comprising a plurality of lens elements or components which are arranged along a common optical axis, at least one of said lens elements or components being a graded refractive index lens, whose refractive index varies with the radial distance from said optical axis, and said graded refractive index lens being located on the object side of a point of intersection of an off-axial principal ray and said optical axis,

wherein the refractive index distribution of said graded refractive index lens is expressed by the formula shown below, and said graded refractive index lens satisfies condition (1) shown below:

$$n = n_0 + n_1 r^2 + n_2 r^4 + n_3 r^6 + \dots$$

$$|n_1| > 7 \times 10^{-4}/f^2 \quad (1)$$

n_0 represents the refractive index on the optical axis, r represents the radial distance from the optical axis, n_1, n_2, n_3, . . . respectively represent the 2nd-, 4th-, 6th-, . . . order coefficients, and f represents the focal length of said objective lens system.

4,880,299

TELECENTRIC Fθ LENS SYSTEM FOR LASER COM

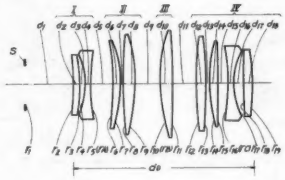
Akiyoshi Hamada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 43,645, Apr. 28, 1987, abandoned. This application Jul. 7, 1988, Ser. No. 216,509

Claims priority, application Japan, Apr. 28, 1986, 61-99065; Apr. 28, 1986, 61-99066

Int. Cl.[4] G02B *13/22, 9/62, 9/64*

U.S. Cl. 350—415 **33 Claims**



1. A telecentric fθ lens system for use in a laser COM comprising, from the object to image side:

a first lens unit including a negative lens component;

a second lens unit consisting of a positive lens component;

a third lens unit including a positive lens component; and

a fourth lens unit including three lens components, of which two lens components are a negative and a positive lens component aligned in order from the object side and the final lens component from the object side is positive, wherein said lens components are respectively spaced from each other on an optical axis.

4,880,300

VISION SAVER FOR COMPUTER MONITOR

Leonard E. Payner, 707 Washington Ave., and Jimmy L. Keener, 701 Washington Ave., both of Elyria, Ohio 44035

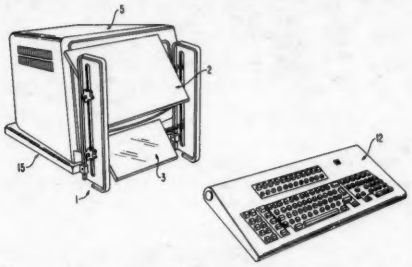
Filed May 6, 1988, Ser. No. 191,079

Int. Cl.[4] G02B *27/02*

U.S. Cl. 350—618 **14 Claims**

1. A vision saver for use with a computer monitor comprising first and second reflecting surfaces and support means for supporting said first and second reflecting surfaces in spaced relation in front of the computer monitor such that said first reflecting surface faces the screen of said monitor and the second reflecting surface, and said second reflecting surface faces said first reflecting surface and outwardly from the screen of said monitor whereby a person can visually observe the screen of the computer monitor by viewing the second

reflecting surface, wherein said support means is free standing and includes a platform for supporting the computer monitor,



and wherein said support means includes means for adjusting the positions of said first and second reflecting surfaces with respect to said support means.

4,880,301

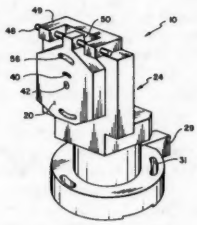
MOUNT FOR AN OPTICAL ELEMENT

Miroslay K. Gross, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1988, Ser. No. 191,524

Int. Cl.[4] G02B *7/18*

U.S. Cl. 350—636 **11 Claims**



1. A mount for use with an optical element which is adapted to receive an input beam and to project an output beam therefrom, said mount being adjustable to position said output beam along a first line in the form of an arc and along a second line which forms an angle with said first line, said mount comprising:

an optical element having an optical surface thereon;

a holder for supporting said element along a first axis such that the optical surface of the element extends transverse to the axis and forms a very small angle with a plane which is perpendicular to the axis;

a base for supporting said holder for rotation about said axis, said base including means operative against said holder for rotating said holder to effect a fine angular adjustment of said beam along said first line; and

means for supporting said holder for rotation about a second axis generally perpendicular to said first axis, said supporting means including adjusting means to effect adjustment of said beam along said second line.

4,880,302

EYE GLASSES FOR APPLYING MAKEUP

Michel Meillet, Centre Commercial Le Plateau, La Duchere Lyon 9 eme-Rhone, France

Filed Apr. 19, 1988, Ser. No. 185,130

Int. Cl.[4] G02C *9/02, 7/08*

U.S. Cl. 351—59 **2 Claims**

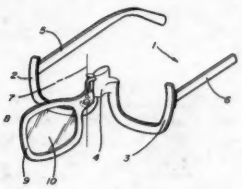
1. In a pair of makeup eyeglasses the improvement comprising:

a frame having a front and a pair of arms;

the front comprising:

a pair of vision frames; each vision frame being defined by only a lower part having a curved profile, such that each vision frame is entirely laterally outside and below the visual range of an associated eye of a user;

a transverse horizontal bridge disposed on a nose of a user connecting the pair of vision frames, the bridge having a vertical axis;



a bracket secured to the bridge along the vertical axis;

a frame horizontally rotatably mounted to the bracket such that the frame can be rotated about a vertical axis, away from the face of a user to abut against either of the one of the pair of vision frames; and

a lens disposed within the horizontally rotatable frame, the bracket, horizontally rotatable frame and lens defining an eyepiece.

4,880,303

OVERHEAD PROJECTOR

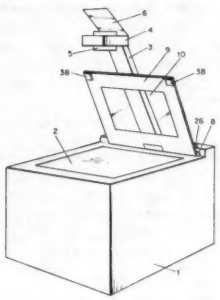
Peter-Hein Grunwald, Schlattstrasse 215, FL 9491 Ruggell, Fed. Rep. of Germany

Filed Feb. 12, 1988, Ser. No. 155,202

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704762; Apr. 16, 1987, 3712999

Int. Cl.[4] G03B *21/20, 21/132*

U.S. Cl. 353—122 **15 Claims**



1. An overhead projector comprising a housing having at its upper side a Fresnel lens and a writing plate overlying said Fresnel lens;

a support arm extending up from a rear side of said housing,

a projection head comprising an objective and a deflection mirror mounted on said support arm in a position above said housing,

a light source comprising a lamp, reflector and condenser lens disposed in said housing in position to direct light up through said Fresnel lens and writing plate to said projection head,

liquid crystal display means in a frame hingedly mounted on said housing by hinge means at said rear side of said hous-

ing for swinging between a lower position overlying said writing plate for projection of an image defined by said liquid crystal display means and a raised position in which said liquid crystal display means is in an upright position adjacent said support arm and is thereby out of a light path between said writing plate and said projection head for projection of an image on said writing plate,

fastening means for releasably securing said liquid crystal display means in said raised position,

means in said housing for controlling said liquid crystal display means and

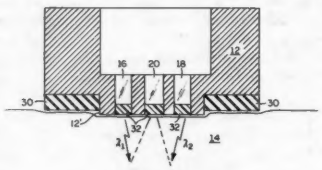
flexible means for electrically connecting said liquid crystal display means with said controlling means.

4,880,304

OPTICAL SENSOR FOR PULSE OXIMETER

Jonathan P. Jaeb; Dennis W. Gilstad, and Ronald L. Branstetter, all of San Antonio, Tex., assignors to Nippon Colin Co., Ltd., Komaki, Japan

Filed Apr. 1, 1987, Ser. No. 33,406
Int. Cl.[4] G01N *33/49*; A61B *5/00*
U.S. Cl. 356—41 **5 Claims**



1. An optical sensor, comprising:

a housing, said housing having a general flat lower surface with a central protrusion extending a predetermined distance from said lower surface, said protrusion adapted to provide an optical couple between said sensor and the surface of a patient's tissue;

a first source of light at a first wavelength for which the absorption coefficients of hemoglobin and oxyhemoglobin are approximately equal and a second source of light at a second wavelength for which said absorption coefficients differ from one another, said first and second sources of light mounted in said central protrusion extending from said lower surface;

light detecting means mounted in said protrusion of said housing to detect light at said first and second wavelengths after contact with arterial blood; and

light absorbing means on said lower surface of said housing surrounding said central protrusion for preventing the transmission of ambient light between the lower surface of said housing and said tissue.

4,880,305

LASER DIRECTION OF ARRIVAL DETECTOR

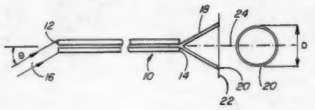
James W. A. Salt, Kanata, Canada, assignor to Her Majesty The Queen as Represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Continuation of Ser. No. 770,751, Aug. 29, 1985, abandoned. This application Mar. 2, 1989, Ser. No. 320,848
Claims priority, application Canada, Dec. 3, 1984, 461127
Int. Cl.[4] G01C *1/00*; H01J *5/16*
U.S. Cl. 356—141 **14 Claims**

1. A detector for use in determining the orientation of a laser beam arriving at the detector, comprising:

a fibre optic bundle having a longitudinal axis with a polished input end disposed at a known orientation, and an output end; and

sensor means adjacent the output end of the bundle for measuring a diameter of a light output from the bundle at a predetermined plane perpendicular to the longitudinal



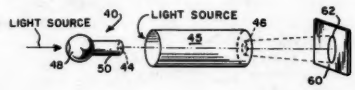
axis, which diameter varies as a function of the angle of the incidence of the laser beam on the input end.

4,880,306

METHOD OF CHECKING COLLINEARITY

Bernard J. Murphy, Mountain Lakes, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 30, 1988, Ser. No. 278,193
Int. Cl.[4] G01B *11/27*
U.S. Cl. 356—153 **7 Claims**



1. In a device having two, axially-spaced, albeit substantially collinearly aligned, conduits of diverse inside diameters, a method of checking collinearity of said conduits, comprising the steps of:

directing light through a first one of the conduits which has the greatest inside diameter;

interposing a planar surface transverse to, and downstream of, the first conduit, to display the light directed therethrough as a circular image on the planar surface;

directing light through a second one of the conduits to create an emerging light beam therefrom; and

displaying the beam on the planar surface to ascertain whether its impingement is centered relative to the circular image, or offset relative to the center of the image.

4,880,307

METHOD OF DETECTING THE POSITION OF AN OBJECT

Motonori Endo, and Hiroshi Minakami, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 5, 1988, Ser. No. 215,098
Claims priority, application Japan, Jul. 6, 1987, 62-167065
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—375 **5 Claims**

1. In a method of detecting- the position of a movable object, the steps comprising:

producing a laser beam;

reflecting the laser beam off said object to produce a reflected beam;

monitoring the reflected beam using a photo responsive sensor;

converting the received reflected beam into a signal indicative of the image produced in said sensor, said signal having a wave form;

detecting the magnitude of a selected parameter of said wave form;

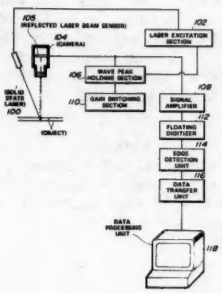
comparing the magnitude with the maximum permissible value;

reducing the power of the laser beam in the event that the magnitude is greater than said maximum permissible value;

determining, in the event that the magnitude is lower than

said maximum permissible limit, if the laser beam power is maximized;

increasing the power of the laser beam in the event that the power thereof is not maximized; and



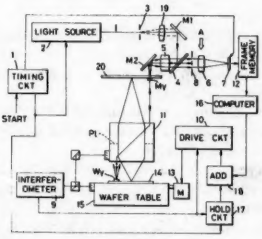
increasing the degree of amplification of said signal in the event that the power of the laser is maximized.

4,880,308

ALIGNING APPARATUS

Hiroshi Shirasu, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 176,760
Claims priority, application Japan, Apr. 8, 1987, 62-86636
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—401 **17 Claims**



1. An apparatus for aligning a first substrate with a second substrate, comprising:

means for relative movement of said first and second substrates for said alignment;

first alignment mark means composed of a pair of mutually different grating marks formed in predetermined positions of said first substrate;

second alignment mark means composed of grating marks formed in predetermined positions of said second substrate to be optically superposed with said pair of grating marks, wherein said grating marks of said second alignment mark means are formed in such a manner that two moiré fringe patterns formed by said optical superposition move in mutually opposite directions during a relative movement of said first and second substrates by said relative movement means;

illumination means containing a pulse light source for instantaneously illuminating said first and second alignment mark means;

means for measuring the relative position of said first and second substrates in synchronization with instantaneous illumination by said illumination means;

image sensor means of charge accumulation type;

an alignment optical system for forming said two moiré fringe patterns on said image sensor means;

determination means for detecting the phase difference of said two moiré fringe patterns from the charge distribution accumulated in said image sensor means corresponding to said moiré fringe patterns and determining a positional deviation between said first and second substrates from detected phase difference in the moiré fringe patterns and from the relative position measured by said position measuring means; and

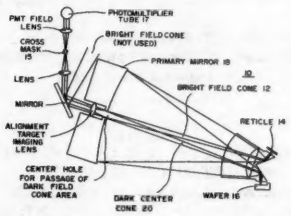
means for driving said relative movement means according to said positional deviation determined by said determination means.

4,880,309

DARK FIELD TARGET DESIGN SYSTEM FOR ALIGNMENT OF SEMICONDUCTOR WAFERS

Mark S. Wanta, N. Richland Hills, Tex., assignor to General Signal Corporation, Stamford, Conn.

Filed Apr. 14, 1987, Ser. No. 38,359
Int. Cl.[4] G03B *27/42*
U.S. Cl. 356—401 **4 Claims**



1. A dark field wafer alignment system comprising

means for exposing a plurality of erticle images in a step and repeat manner onto a semiconductor wafer, and

means for aligning each reticle image to targets in the wafer scribe area wherein said means for aligning include alignment marks having a generally cross-shaped configuration of arms wherein each arm o said configuration is in the shape of a series of separate zigged shaped target structures so as to provide a sufficient edge length and surface area to reflect more light from the center of the target rather than the sides thereof.

4,880,310

OPTICAL DEVICE FOR ALIGNMENT IN A PROJECTION EXPOSURE APPARATUS

Kenji Nishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 76,740, Jul. 23, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,559
Claims priority, application Japan, Jul. 28, 1986, 61-175702; Dec. 5, 1986, 61-288929
Int. Cl.[4] G03B *27/52*
U.S. Cl. 356—401 **17 Claims**

1. A device for aligning an object provided with first alignment mark means and a substrate provided with second alignment mark means, comprising:

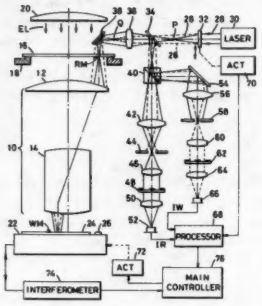
means for disposing said object and said substrate on first and second planes, respectively;

an imaging optical system provided between said first and second planes so that said first and second planes are substantially conjugate with each other with respect to said imaging optical system under a first wavelength;

means for radiating an energy beam having a second wavelength differing from said first wavelength;

optical means, provided between said radiating means and

said first plane, for condensing a first beam part separated from said energy beam onto said first plane to form a beam spot on said first alignment mark means and condensing a second beam part separated from said energy beam onto said second plane in cooperation with said imaging optical



system to form a beam spot on said second alignment mark means; and

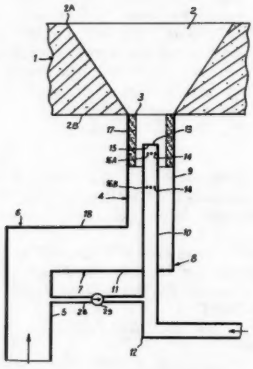
means for detecting the relative position of said object and said substrate on the basis of optical information from said first and second alignment mark means.

4,880,311

APPARATUS FOR SUPPLYING UNCLOGGING GAS TO FLUIDIZED BED APPARATUS

Arnaud Delebarre, Lille, and Paul W. Witwicki, Bethune, both of France, assignors to Charbonnages DeFrance, Paris, France

Filed Oct. 21, 1986, Ser. No. 921,254
Claims priority, application France, Oct. 21, 1985, 85 15580
Int. Cl.[4] B01F *13/02*
U.S. Cl. 366—101 **7 Claims**



1. A fluidized bed apparatus comprising:

a grid having an upper face for supporting particles to be fluidized and having at least one concavity defined therein, each said concavity having a lower inlet so that each said concavity defines a blow opening of the grid,

a fluidization gas supply tube connected to each said lower inlet of each said at least one concavity, respectively, each said gas supply tube being open towards said particles to be fluidized so that at least some of the said particle fall thereinto and including limiting means for stopping the fall of particles through said tube, and

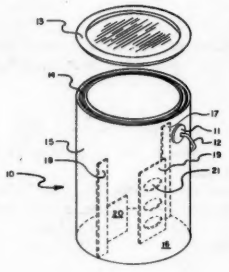
an unclogging apparatus for each said gas supply tube including an injection tube coming from a source of unclogging fluid, passing through the wall of said gas supply tube and disposed inside said supply tube, said injection tube having at least one lateral orifice located between said upper face of the grid and the limiting means, the upper end of said injection tube being closed, said gas supply tube limiting the unclogging effect of said unclogging apparatus at a useful lower limit.

4,880,312

MIXING APPARATUS

John T. Carlson, 811 Ashland Ave., St. Paul, Minn. 55104

Filed Mar. 24, 1988, Ser. No. 173,249
Int. Cl.[4] B01F *9/12, 13/00*
U.S. Cl. 366—130 **5 Claims**



1. A conveniently carryable integral plastic molded mixing apparatus for mixing paint, stain and like liquids typically subject to separation and settlement of their various components, comprising

a cylindrical container, consisting of a bottom and a side having inner and outer surfaces and a handle for lifting and carrying the container

a plurality of perimeter baffles molded into the container and extending upwardly from said bottom and inwardly from said inner surface,

first and second inner baffles molded into the container and extending upwardly from said bottom and offset from the perimeter baffles, each other and the center of said bottom and oriented in a generally spaced parallel relation to said perimeter baffles, and

said perimeter baffles extending upwardly approximately two-thirds and said first inner baffle extending upwardly approximately one-half the heighth of said inner surface to obstruct the free flow of liquid in said container when said container is manually rotated by the handle and to permit clean pouring of the liquid from the container without messy dripping out of the container from the baffles.

4,880,313

METHOD AND NOZZLE FOR MIXING MEDIUMS OF DIFFERENT VISCOSITY

Heinz Loquenz, Graz, and Siegfried Meissl, Stallhofen, both of Austria, assignors to Waagner-Biro Aktiengesellschaft, Austria

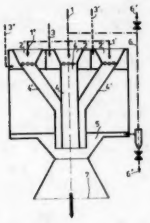
Filed Nov. 24, 1987, Ser. No. 124,889
Claims priority, application Austria, Nov. 26, 1986, A 3156/86
Int. Cl.[4] S14E *44/10*
U.S. Cl. 366—336 **16 Claims**

1. Method of mixing media of two different viscosities, which comprises

splitting a liquid medium which is a cellulose suspension into at least two liquid partial streams,

passing a first one of said liquid partial streams into an injector having an inlet region and an outlet region, at the inlet region of the injector,

passing a stream of gaseous medium into the injector in the region of the inlet, whereby said first liquid partial stream mixes with said gaseous medium as the first liquid partial stream flows toward the outlet region,



introducing at least one remaining liquid partial stream into the flow at the outlet region, whereby the introduced liquid partial stream is mixed with said flow of first liquid partial and gaseous streams to form a combined stream, and

decelerating the flow of the combined stream, whereby the gaseous stream becomes intimately admixed with the liquid stream without formation of bubbles or low viscosity streaks, and cellulose contained in the cellulose suspension is effectively bleached by the gaseous medium.

4,880,314

PYROMETRIC MEASUREMENT PROCEDURE AND MULTI-CHANNEL PYROMETER

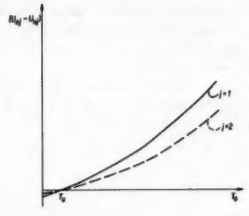
Ulrich Kienitz, Dresden, German Democratic Rep., assignor to VEB Messgeraetewerk "Erich Weinert" Magdeburg, Betrieb des Kombinates VEB EAW Berlin-Treptow, Magdeburg, German Democratic Rep.

Filed Jun. 17, 1986, Ser. No. 875,125

Claims priority, application German Democratic Rep., Jul. 30, 1985, 279119

Int. Cl.[4] G01J *5/56, 5/52*

U.S. Cl. 374—129 **3 Claims**



1. A pyrometric measuring method for determining the temperature T_o of surfaces with different emissivities ϵ_{ij} at j=1 to n effective wavelengths by the measurement of the spectral signal voltages U_j in j=1 to n spectral channels at a known ambient temperature T_u and by means of a functional relationship between the signal voltage difference $U_{oj}-U_{uj}$ and the object temperature of a black-body radiator, said relationship being measured in a calibration process, comprising measuring at a known surface temperature T_o the respective signal voltages U_{ij} in the j=1 to n spectral channels for i=1 to m user-specific surface materials i differing in emissivity, wherein n and m are integers and, using the functional relationship between the difference $U_{oj}-U_{uj}$ and the object temperature that is calibrated on a black-body radiator, determining the associated signal voltage differences $U_{oj}-U_{uj}$ and calculating the respective emissivities ϵ_{ij} for the user-specific i=1 to m surface materials according to the equation

$$\epsilon_{ij} = \frac{U_{ij}}{U_{oj} - U_{uj}}$$

and storing them, measuring, in a measurement step on the unknown surface material i and at an unknown surface temperature T_o, the spectral signal voltage U_j in the j=1 to n spectral channels, determining for each spectral signal voltage U_j obtained in the measurement step, the signal voltage differences $U_{oij}-U_{uj}$ at the calibrated surface materials i according to the equation

$$U_{oij} - U_{uj} = U_j/\epsilon_{ij}$$

using the stored emissivity ϵ_{ij}, determining with the help of the functional relationship between the surface temperature T_o and the difference $U_{oj}-U_{uj}$ in the respective spectral channel j as calibrated at the black-body radiator, the associated object temperatures T_{oij} for each material i, using the previously determined differences $U_{oij}-U_{uj}$ for the differences $U_{oj}-U_{uj}$ obtained at the black-body radiator, and determining the scatter of the object temperatures T_{oij} for each material i in the j=1 to n spectral channels, the average value of the n object temperatures T_{oij}, which have the least scatter for a material i, corresponding to the true object temperature T_o.

4,880,315

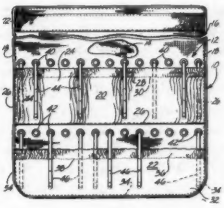
ROLL-UP CARRYING BAG WITH ADJUSTABLE COMPARTMENTS

Marilee G. Berry, and Dickey J. Berry, both of 5787 Via Barcelona, La Verne, Calif. 91750

Filed Nov. 14, 1988, Ser. No. 270,642

Int. Cl.[4] A45C *13/02;* **B65D** *30/22*

U.S. Cl. 383—39 **7 Claims**



1. A configurable carrying bag comprising:

a main panel formed by a flexible material;

at least one elongated pocket-forming panel made from a flexible material, overlying and extending across a portion of the main panel;

means permanently fastening the pocket-forming panel to the main panel, so as to form an elongated main pocket between the overlying panels, with an elongated opening to the interior of the main pocket extending across a top portion of the pocket-forming panel;

a row of fastening means affixed adjacent to and mutually spaced apart along the opening of the main pocket; and

a plurality of pin means, each adapted for releasable attachment to the individual fastening means, and each selectably movable from its fastened condiion, between an unused position and an in-use position to releasably secure the pocket-forming panel to the main panel to thereby form separate, reconfigurable dividers at intervals along the main pocket for configuring the main pocket into

smaller, individual pockets of selective width, between the dividers, the pin means each being movable from its in-use position to said unused position for use in constantly reconfiguring the arrangement of smaller pockets;

the main panel having a flexible flap portion extending away from the pocket-forming panel to provide a cover for articles contained in the reconfigurable pockets.

4,880,316

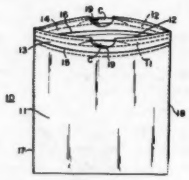
MULTIPLE LAYER HAND-GRIP REINFORCEMENT FOR THERMOPLASTIC DRAW TAPE HANDLES FOR THERMOPLASTIC BAGS

Kirk E. Belmont, Fairport; Edward M. Bullard, East Rochester; Daniel J. DiBiasi, Pittsford; Edward W. Forman, Jr., and David E. McIntyre, both of Palmyra, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 3, 1988, Ser. No. 201,798

Int. Cl.[4] B65D *33/02, 33/10, 33/28*

U.S. Cl. 383—75 **13 Claims**



1. A thermoplastic draw tape bag for carrying trash and the like having a multiple layer hand-grip reinforcement for the draw tape handle comprising:

two thermoplastic panels forming an open top, closed bottom bag, the panels being joined along the sides of the bag;

a hem on each of said panels folded over adjacent the top, the bottom and ends of each hem being sealed to the adjacent panel, each of the hems having a cut out opening intermediate the ends of the hems; and

a thermoplastic draw tape handle disposed in each hem secured to the ends of said hem and each draw tape comprising a center section and two side sections, the side sections each comprising a single layer of tape being secured to the ends of the hem and the center section being in alignment with said cut out opening and comprising a folded over multiple layer tape area, the multiple layer tape area having a length adequate to provide a hand-grip reinforcement for the tape so that when the center section is gripped and pulled through the cut out opening in the hems to draw closed the open top of the bag, the multiple layer hand-grip reinforcement minimizes the discomfort caused by roping at the center section while the bag is under load.

4,880,317

ANGULAR CONTACT LINEAR SLIDE BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,276

Claims priority, application Japan, Mar. 20, 1987, 62-63666; Mar. 20, 1987, 62-63667

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—45 **10 Claims**

1. An angular contact linear slide bearing comprising:

a bearing block including a pair of ball rolling surfaces formed adjacent to each other and positioned such that respective load lanes through said ball rolling surfaces diverge from each other, and unloaded ball passages each formed in opposing relationship with the corresponding one of said ball rolling surfaces;

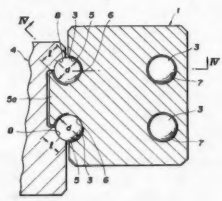
end caps mounted to respective ones of the opposite end surfaces of said bearing block for providing communication between the opposite ends of each of said ball rolling surfaces and the opposite ends of the corresponding one of said unloaded ball passages to thereby form a pair of endless tracks;

a multiplicity of balls which roll along each of said endless tracks; and

a track rail having a pair of ball rolling grooves along which said balls roll in a loaded state while they are rolling on said ball rolling surfaces of said bearing block;

said bearing block further including:

a separation portion; and



a pair of leaded ball grooves separated by said separation portion and provided with openings which are positioned such that said load lines diverge from each other, said ball rolling surfaces form in said loaded ball grooves, with each ball rolling surface having a first longitudinal side and a second longitudinal side, an up load ball groove formed in each loaded ball groove adjacent said first longitudinal side of the respective ball rolling surface, and a down load ball groove formed in each loaded ball groove adjacent said second longitudinal side of the respective ball rolling surface, each up and down load ball groove being recessed with respect to the respective ball rolling surface, the up and down load ball grooves of each loaded ball groove defining said opening of the respective loaded ball groove, with said opening having an opening width smaller than at least the diameter of each of said balls.

4,880,318

SLIDABLE VIBRATION-ISOLATING RUBBER MEMBER

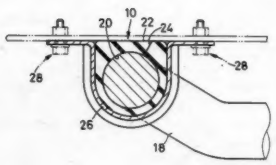
Akihiro Shibahara, Komaki; Takehiko Taguchi, Kasugai; Akira Uehara, Inuyama; Koji Shinohara, Kasugai, and Hiroshi Kawaguchi, Komaki, all of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Jan. 15, 1988, Ser. No. 144,070

Claims priority, application Japan, Jan. 21, 1987, 62-11957; Jan. 23, 1987, 62-14611; Feb. 20, 1987, 62-38674

Int. Cl.[4] F16C *33/22*

U.S. Cl. 384—125 **15 Claims**



1. A slidable vibration-isolating rubber bushing interposed between two members in a suspension system of a motor vehicle such that the rubber bushing is slidable relative to at least

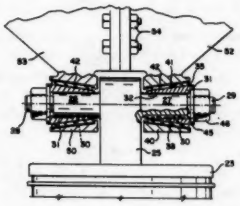
one of said two members, said rubber bushing being formed from a rubber composition which comprises 100 parts by weight of a rubber material consisting of at least one material selected from the group consisting of natural rubber, butadiene rubber, isoprene rubber, styrenebutadiene rubber, chloroprene rubber, acrylonitrile-butadiene rubber, ethylene-propylene rubber nd isobutylene-isoprene rubber, and 2–20 parts by weight of a silicone oil having a kinematic viscosity of 10–300 centistokes at 25°C.

4,880,319

BEARING ASSEMBLY

John A. Haggerty, Norton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 5, 1986, Ser. No. 859,677
Int. Cl.[4] F16C *33/22*
U.S. Cl. 384—215 **7 Claims**



1. A bearing assembly for a vehicle wheel comprising a stationary wheel support bracket, a shaft extending laterally from said bracket, a sleeve mounted on and secured to said shaft, the outer surface of said sleeve tapers inwardly towards said bracket, an annular elastomeric ring bonded to said tapering outer surface of said sleeve, an elongated arm with a hub portion thereon, said hub portion having a central bore that is frusto-conical in shape, said central bore of said hub frictional contacting said annular ring, and means for securing said tapering sleeve with said annular ring on said shaft wherein the surface of said central bore has a layer of anti-friction material bonded thereto for frictional engagement by said elastomeric ring.

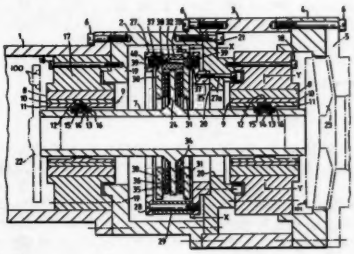
4,880,320

FLUID FILM JOURNAL BEARINGS

Derrick J. Haines, Hatfield, and Harry Marsh, Durham City, both of England, assignors to British Aerospace plc, London, England

Filed Mar. 10, 1988, Ser. No. 166,372
Claims priority, application United Kingdom, Mar. 10, 1987, 8705644; PCT Int'l Appl., Jun. 10, 1987, PCT/GB87/00403
Int. Cl.[4] F16C *27/02*
U.S. Cl. 384—215 **5 Claims**

1. An assembly of a support bearing member, and a rotary system including a rotor and a rotary bearing member, the support and rotary bearing members constituting a fluid-film journal bearing for radially locating the rotor and the rotary bearing member being mounted to rotate with the rotor but with circumferentially spaced adjustable means for creating resiliently controlled radial play relative to the rotor so that there is a tendency, if rotor whirl sets in, for the relative radial positions of the rotor and rotary bearing member and hence also the dynamic balance of the rotary system to alter, the assembly being such that said tendency results in the generating of force components which act upon said system to inhibit growth of said rotor whirl.

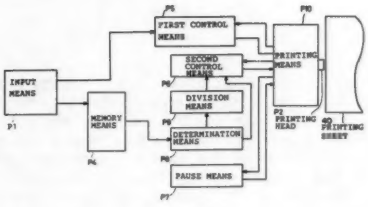


4,880,321

PRINTING APPARATUS FOR AUTOMATICALLY CONDUCTING A CARRIAGE RETURN

Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Nov. 17, 1987, Ser. No. 122,917
Claims priority, application Japan, Nov. 20, 1986, 61-277312
Int. Cl.[4] B41J *5/30*
U.S. Cl. 400—64 **5 Claims**



1. A printing apparatus for printing characters on a printing sheet by a printing head, which comprises:

input means for inputting character data and punctuation data,

memory means for sequentially storing the character data and punctuation data,

printing means for printing characters along a printing line, by the printing head, corresponding to the character data and punctuation data,

first control means for controlling the printing means to print each character corresponding to the character data when the printing head is located between a left margin and a predetermined position of the printing line,

pause means for controlling the printing means to pause when the printing head comes to a predetermined region lying between said predetermined position and a right margin and after said pause means is activated, said memory means sequentially stores said inputted character and punctuation data as a set of characters,

determination means for determining if said stored set of characters, corresponding to a series of character data punctuated by said punctuation data, can be printed within the predetermined region,

division means for dividing said set of characters into two parts according to a predetermined rule when said determination means determines said set of characters can not be printed within said predetermined region, and

second control means for controlling said printing means to print said set of characters within said predetermined region when the determination means determines said set of characters can be printed within said predetermined region, otherwise for controlling the printing means to print a former part of said set of characters, divided by the division means, in said predetermined region, and to print a latter part of said set of characters in the head of a next printing line.

4,880,322

METHOD FOR REBOUND DAMPING OF PRINT HAMMER MAGNETS IN TYPEWRITERS OR SIMILAR OFFICE MACHINES

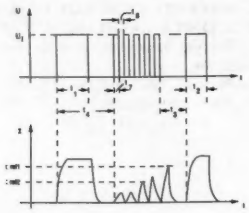
Christian Jensen, Nuremberg, and Gunther Schmidt, Schnaittenbach, both of Fed. Rep. of Germany, assignors to TA Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 195,783

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739295

Int. Cl.[4] B41J *9/42*

U.S. Cl. 400—167 **2 Claims**



1. A method of damping the rebound of printing-hammer magnets in a typewriter, the typewriter comprising a programmable control unit, consisting of at least one microprocessor and memory means, wherein the impression of a type is effected by acting on the printing-hammer magnet with a predetermined first potential gradient over a predetermined first time and the damping of the rebound effect by a braking pulse with a predetermined second potential gradient over a predetermined second time, by means of the control unit, said control unit performing the steps of applying measuring pulses having a predetermined voltage, pulse width and pulse spacing to the winding of the printing hammer magnet during the impression of a character after the first time has elapsed;

measuring the current flowing through the winding of the printing hammer magnet during each of said measuring pulses by means of a current measuring circuit and comparing it with a reference value;

presetting a third time when the reference value is reached; and

after the third time has elapsed, applying the predetermined second potential gradient to the winding of the printing-hammer magnet during the predetermined second time.

4,880,323

HIGH-SYMBOL DENSITY PRINTER CARTRIDGE HAVING A FLEXIBLE EXIT ARM, GEAR SHIELD AND SUPPORT SPACERS

Charles E. Milliser; John M. Karalevicz, and Harry C. Quick, all of Waynesboro, Va., assignors to Genicom Corporation, Waynesboro, Va.

Continuation-in-part of Ser. No. 81,245, Aug. 4, 1987, abandoned. This application Apr. 19, 1988, Ser. No. 183,083

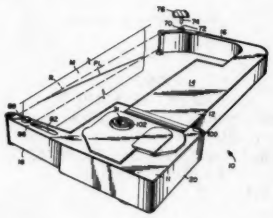
Int. Cl.[4] B41J *32/02*

U.S. Cl. 400—196.1 **28 Claims**

1. A printer cartridge for carrying a print ribbon for disposition in a print position between a printhead and a print recording medium, comprising:

a housing defining a storage chamber for the ribbon;

means including ribbon exit and entrance arms spaced one from the other and projecting from said housing for routing the ribbon from the storage chamber along said exit arm into the print position located in the span between said arms and from the print position along said entrance arm to the storage chamber;



means for moving the ribbon into said storage chamber thereby displacing the ribbon from the exit arm through the print position and along the entrance arm;

one of said arms comprising a ribbon guide proximate its end remote from said cartridge for guiding ribbon from said span to said entrance arm, means for minimizing adverse loading on said ribbon during high density printing comprising dimensioning said one arm to flex along the direction of ribbon movement in said span during such high density printing while maintaining said guide perpendicular to said ribbon movement.

4,880,324

TRANSFER METHOD FOR HEAT-SENSITIVE TRANSFER RECORDING

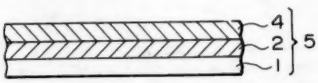
Hiroshi Sato, Hiratsuka; Kazumi Tanaka, Yokohama; Naoki Kushida, Yokohama; Masato Katayama, Yokohama; Yasuyuki Tamura, Yokohama; Tetsuo Hasegawa, Tokyo; Hisao Yaegashi, Yokohama; Shuzo Kaneko, Tokyo; Koichi Tohma, Kawasaki, and Takayuki Suzuki, Saitama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1986, Ser. No. 819,497

Claims priority, application Japan, Jun. 24, 1985, 60-136179; Jun. 24, 1985, 60-136180

Int. Cl.[4] B41M *5/26*

U.S. Cl. 400—241 **18 Claims**



1. A heat-sensitive transfer recording method, comprising:

providing a heat-sensitive transfer medium comprising a support and at least two heat-transferrable ink layers including a first ink layer and a second ink layer disposed in the order named on the support,

superposing the transfer medium on a recording medium to contact the recording medium,

heating the transfer medium in a pattern corresponding to information to be recorded, wherein the adhesion strength between the first ink layer and the support (F_1) and the adhesion strength between the two ink layers (F_2) are such that $F_1 > F_2$ before and $F_1 < F_2$ after a predetermined time after heating, whereby the number of ink layers transferred from the transfer medium onto the recording medium depends on the length of time after heating until

the transfer medium is separated from the recording medium, and

separating the transfer medium from the recording medium after a predetermined length of time such that a transferred ink pattern of a prescribed number of ink layers is left on the recording medium, whereby the second ink layer is selectively transferred to the recording medium in a shorter time until separation, and both the first and second ink layers are transferred to the recording medium in a longer time until separation.

4,880,325

INK RIBBON CASSETTE INCLUDING MEANS FOR IDENTIFYING THE TYPE OF INK RIBBON CONTAINED THEREIN AND CONTAINING AN INK RIBBON HAVING END INDICATION MEANS

Hiroyuki Ueda, Kawasaki; Yasuaki Yamada, Matsudo; Toshiaki Ozawa, Chiba; Hiroharu Nakajima, Kodaira, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

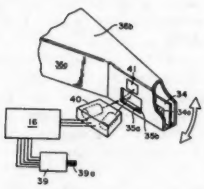
Continuation-in-part of Ser. No. 778,266, Sep. 20, 1985, abandoned, which is a division of Ser. No. 664,945, Oct. 26, 1984, abandoned, which is a continuation of Ser. No. 314,441, Oct. 23, 1981, abandoned, and a continuation-in-part of Ser. No. 778,294, Sep. 20, 1985, Pat. No. 4,655,624, which is a continuation of Ser. No. 661,271, Oct. 16, 1984, abandoned, which is a continuation of Ser. No. 541,067, Oct. 12, 1983, abandoned, which is a continuation of Ser. No. 462,006, Jan. 28, 1983, Pat. No. 4,494,886, which is a continuation of Ser. No. 242,348, Mar. 10, 1981, abandoned. This application Jan. 6, 1987, Ser. No. 4,271

Claims priority, application Japan, Mar. 17, 1980, 55-33590; Oct. 31, 1980, 55-152103; Oct. 31, 1980, 55-152104; Oct. 31, 1980, 55-152105; Oct. 31, 1980, 55-152106; Nov. 17, 1980, 55-160692; Nov. 17, 1980, 55-160693; Nov. 17, 1980, 55-160694; Nov. 25, 1980, 55-164527; Nov. 25, 1980, 55-164530; Nov. 28, 1980, 55-166635

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] B41J *35/36*

U.S. Cl. 400—249 **17 Claims**



1. An ink ribbon cassette, comprising:

a cassette body being mountable on a printer for rocking during operation between a first position and a second position;

first and second substantially coextensive spaced ink ribbon guide arms projecting from said body, each having a projecting free end;

an ink ribbon mounted in said body for advancement during printing and having a portion extending between the free ends of said guide arms so as to be available for printing;

ribbon-end indicating means formed at the end of the ink ribbon for indicating the approach of the end of the ink ribbon;

means for rendering said ribbon-end indicating means visible to a photo detector that is located on the printer entirely outside the periphery of said cassette, said cassette undergoing pivotable movement relative to the photo detector as said cassette rocks between the first and second positions, said rendering means having a light transparent part in a wall of said first ink ribbon guide arm; and

ribbon-type indicating means formed on the wall of said first ribbon guide arm for indicating to the photo detector which of several types of ink ribbon is in said cassette body, wherein the light transparent part and said ribbon-type indicating means are arranged along the wall of said first ribbon guide arm and are located relative to each other such that said ribbon-end indicating means can be detected by the photo detector when said cassette body is in the first position and said ribbon-type indicating means can be detected by the same photo detector when said cassette body is in the second position.

4,880,326

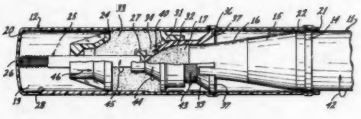
LIPSTICK DISPENSER

James R. Spivey, Irvine, and William J. Dee, Chino, both of Calif., assignors to Spiveco, Inc., Anaheim, Calif.

Filed May 24, 1988, Ser. No. 198,390

Int. Cl.[4] A45D *40/00, 40/06*

U.S. Cl. 401—123 **21 Claims**



1. A lipstick dispenser, comprising:

an applicator member and a cover member that can be separated for use and rejoined for storage;

the applicator member having an applicator tip to be used for lipstick application purposes;

the cover member having a hollow interior that extends along a cover member axis to an open end of the cover member, which open end is dimensioned and arranged to receive the applicator tip;

the cover member containing a supply of lipstick and an extrusion mechanism for extruding an amount of the lipstick toward the open end; and

the extrusion mechanism including means for enabling a user to operate the extrusion mechanism by moving the applicator member relative to the over member while the applicator tip is within the open end.

4,880,327

GRAVITY LOCK BOOKSTAND AND BINDER

Ronaldo M. Sanabria, Chicago, Ill., assignor to Richard F. Sanabria, Chicago, Ill., a part interest

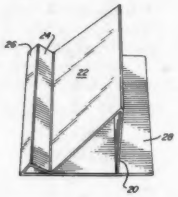
Filed Sep. 16, 1988, Ser. No. 245,285

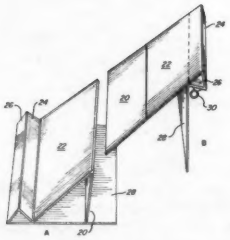
Int. Cl.[4] B42F *13/00, 5/00;* **B42D** *3/00*

U.S. Cl. 402—73 **13 Claims**

1. I claim a collapsible display stand from an elongated flat structure comprising five panels of relatively stiff sheet like material sequentially hinged in manufacture, said elongated structure being foldable into a compact display stand with the first panel sandwiched in substantial planar tangency within the second and fifth panels, the second and third panels serving as the top cover, the fourth panel acting as the spine or backbone and the fifth panel becoming the rear or bottom cover of the closed display stand, from which collapsed state it can be readily erected by lifting the second panel pivoted on its commmon hinge with the third panel, allowing the first panel which becomes a support panel to rest perpendicularly on the fifth panel which becomes the display stand's base panel, the second panel leaning rearwardly becomes a back-rest panel for the display material, said second panel forming a tilted approximate right angle with the attached downwardly sloping third panel which becomes an inclined shelf panel, supported in elevation through its common hinge by the upright fourth panel or backbone panel serving now as the display stand's front support panel, means for maintaining rigidly this approximate quadrature relationship between second and third panels,

thus forming a secure well on which the bottom of the display material can rest preventing forward and upward slippage, as the vertical component of the displayed material's weight pulls





said first panel in secure gravity lock when placed on a flat level surface, this gravity lock force disappearing with the removal of the load, allowing easy collapse and folding of the display stand.

4,880,328

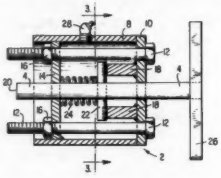
DRIVE ENGAGEMENT APPARATUS

Michael R. Feddick, W. 5655 Pine Ave., Medford, Wis. 54451

Filed Nov. 15, 1988, Ser. No. 271,276

Int. Cl.[4] B60B *27/00*

U.S. Cl. 403—1 **8 Claims**



1. Apparatus for attachment to a powered hub assembly of a vehicle for selectively engaging or disengaging a rotatable and axially shiftable power shaft of said vehicle, comprising:

a body provided with a bore therethrough and means for mounting said body on the hub assembly;

a plunger reciprocally mounted in said bore for operable coupling to an outer end of said axially shiftable power shaft for axially moving said power shaft;

spring means for outwardly biasing said plunger; and

locking bar means within said body extending transversely from said plunger for engaging shoulder means for restraining said plunger when said plunger and said power shaft are in a first position and for disengaging said shoulder means when said plunger and power shaft are in a second position.

4,880,329

JOINT

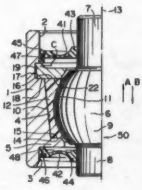
Motohiro Sakai, Komaki, Japan, assignor to Tokai TRW & Co., Ltd., Kasugai, Japan

Filed Jun. 22, 1988, Ser. No. 209,872

Claims priority, application Japan, Jun. 30, 1987, 62-161202

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—134 **4 Claims**



1. A joint comprising:

a cylindrical socket which is opened at at least one end thereof and has an annular groove in an inner circumferential wall thereof at said one open end side;

an inner joint portion having a ball-shaped portion and at least one shaft portion integral with said ball-shaped portion;

a bearing portion fitted in said socket portion and having a recess which has a configuration complementary to an outer configuration of said inner joint portion, said recess rockably and slidably supports said ball portion of said inner joint portion, said bearing portion being supported at an end of said socket opposite to the open end of said socket by a flange portion which projects radially inward from the end of said socket opposite to said open end;

a support member disposed in the annular groove so as to cooperate with said flange portion to support said bearing portion in the axial direction, said support member comprising a plug having a tabular portion which contacts end surfaces of said bearing portion at said open end and a cylindrical portion axially extending from an outer periphery of said tubular portion towards said one open end, said cylindrical portion having an upper expanded end, formed by caulking said cylindrical portion once said plug is disposed in said annular groove, that abuts a side wall of said annular groove so as to hold said plug in said annular groove and a lower end spaced from said side wall so as to allow the residue caulking material to accumulate; and

a boot portion disposed between said shaft portion of said inner joint portion and said socket so as to prevent foreign matter from coming into a gap between the sliding contact surfaces of said bearing portion and said ball-shaped portion.

4,880,330

PISTON PIN

Siegfried Mielke, Neckarsulm, Fed. Rep. of Germany, assignor to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Oct. 27, 1987, Ser. No. 114,274

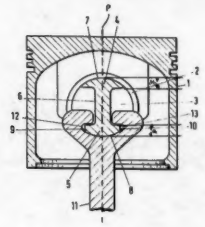
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1986, 3636913

Int. Cl.[4] F16C *11/06*

U.S. Cl. 403—152 **17 Claims**

1. In a piston pin for pistons of reciprocating piston machines, in particular internal combustion machines, wherein the pin is I-shaped in cross-section and has flanges which are connected by a web and support the piston at piston pin bosses and have outside surfaces which have the contour of an arc of a circle having the same radius, the improvement wherein the width of one flange which is nearer to a connecting rod is

smaller by 5 to 35% than the width of the other flange that is nearer to the piston head and wherein the outside surface of the



flange having a smaller width merges toward both sides with edges into surfaces which are parallel to the plane in which a load is applied.

4,880,331

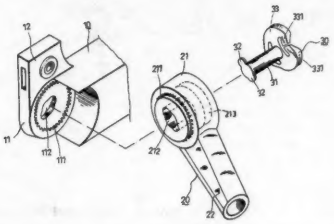
RELEASABLE SWIVEL LOCK ASSEMBLY FOR A CANOPY SUPPORT OF A STROLLER

Hong-Fu Zun, No. 59, Alley 85, Lane 673, Chung Chen Road, Yi-Chia Village, Jen Te Hsiang, Tainan Hsien, Taiwan

Filed Apr. 25, 1988, Ser. No. 185,908

Int. Cl.[4] F16B *1/00*

U.S. Cl. 403—24 **8 Claims**



2. A swivel lock assembly for a canopy support of a stroller, said assembly comprising:

a frame portion having a first bore therethrough, a first engagement means, and an outer surface;

a canopy support portion having a second bore therethrough, a tubular supporting portion and a second engagement means; and

a pivot, said pivot having an abutment extrusion radially projecting from one end of said pivot for abutting against said outer surface, and a resilient press extrusion extending from the other end of said pivot so that when said pivot is inserted through said second bore and said first bore, said press extrusion resiliently presses said second engagement means against said first engagement means thereby preventing relative movement between said canopy portion and said frame portion.

4,880,332

COLLAPSIBLE BARRIER FOR VEHICULAR TRAFFIC

Paul S. Batchelor, 42 Ashmore Street, Erskinville, New South Wales, 2043, Australia

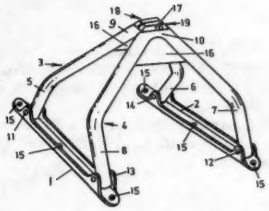
PCT No. PCT/AU87/00272, § 371 Date Apr. 14, 1988, § 102(e) Date Apr. 14, 1988, PCT Pub. No. WO88/01320, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 18, 1987, Ser. No. 235,682

Claims priority, application Australia, Aug. 18, 1986, PH7474

Int. Cl.[4] E01F *13/00*

U.S. Cl. 404—6 **3 Claims**



1. A collapsible barrier comprising two inverted generally Vee shaped members with the free ends of the legs of the members pivotally connected to base means with the axes of pivoting of the respective members parallel thereby enabling the members to be raised into an operative vehicle obstructing condition with the apexes of the Vee members in close physical relationship and elevated above the base means and to be lowered to an inoperative position to allow vehicles to pass over the members, and releasable lock means to secure the members together in the operative condition.

4,880,333

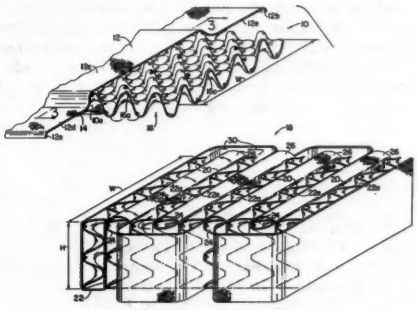
SUBTERRANEAN FLUID FILTERING AND DRAINAGE SYSTEM

Joseph Glasser, 15 Westwood Rd., Storrs, Conn. 06263, and Ursula E. Laak, 149 Brown Rd., Storrs, Conn. 06268

Filed Jul. 22, 1988, Ser. No. 223,207

Int. Cl.[4] E02B *11/00*

U.S. Cl. 405—43 **15 Claims**



1. A subterranean drainage system for fluid filtration, said system comprising fluid conduit means oriented generally horizontally to provide an elongated subterranean cavity for receiving fluid to be filtered, said fluid conduit means including at least one layer of filter fabric provided around at least a portion of said elongated cavity and having laterally outwardly extending marginal edge portions, said fluid conduit means providing communication between said cavity and the region below said marginal edge portions, fluid filtering means

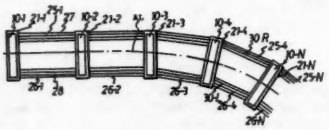
below said inlet conduit means and including a plurality of fluid impervious core sheets, said sheets oriented parallel to one another and having non-planar opposed faces arranged in spaced relation to one another to form a generally rectangular elongated stack of width (W) and height (H), fluid pervious filter fabric wrapped in serpentine fashion around said non-planar faces of said core sheets to provide at least one layer of fabric of width (W) and height (H) adjacent said non-planar faces of said core sheets.

4,880,334

TUNNEL CONSTRUCTION APPARATUS AND METHOD

Giosue Miotti, Lugano, Switzerland, assignor to Finic, B.V., Rotterdam, Netherlands

Filed Apr. 11, 1988, Ser. No. 180,461
Int. Cl.[4] E01G *4/02*; E21D *10/04*
U.S. Cl. 405—149 **6 Claims**



1. A method of constructing a underground tunnel along a given path, precasting in molds above ground at least a pair of frame elements, each frame element comprising a cross brace and a pair of vertical side column members, sidewall keyway means formed in said vertical side column members, precasting in molds above ground at least a pair of wall panel elements having lateral ends for adapted to enter said keyway means in respective ones of said vertical side column of said elements,

excavating, under the presence of a slurry, at least a pair of slots in the earth, said at least a pair of slots extending laterally transverse to the longitudinal direction of said tunnel along said given path,

inserting one each of said frame elements into each said rectangular slots in the earth,

excavating a pair of sidewall slots between the lateral ends of said pair of rectangular laterally extending slots,

inserting one each of said wall panels in said side slots and with the respective lateral ends in keyway engagement with said keyway means formed in said elements, and

forming a concrete floor and roof for said tunnel between said wall elements and said frame elements.

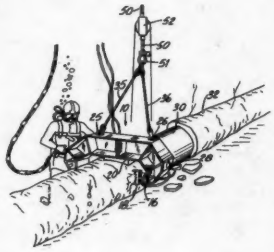
4,880,335

METHOD AND APPARATUS FOR REMOVING CONCRETE COATING FROM PIPE

Charles M. Lee, Virginia Beach, Va., assignor to Arabian American Oil Company, Dhahran, Saudi Arabia

Filed Aug. 21, 1987, Ser. No. 87,867
Int. Cl.[4] F16L *1/00*
U.S. Cl. 405—158 **28 Claims**

1. Apparatus for the removal of a concentric cementitious coating form a coated pipeline comprising a generally C-shaped rigid frame member defining an intermediate central section and opposing end sections, an inwardly facing stationary rigid support member affixed to the intermediate central section and adapted to contact the outer surface of the coated pipeline, drive means affixed to each opposing end section, a plurality of opposed, inwardly facing crusher blades adapted to penetrate the cementitious coating, each of the crusher blades adapted to move in response to movement of the drive



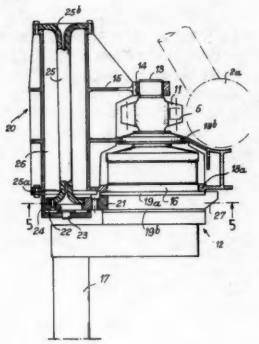
means, and means for providing a controlled driving force from a remote source to the drive means.

4,880,336

SUSPENSION DEVICE FOR THE SUPPORT LEGS OF A JACK-UP OIL PLATFORM

Pierre-Armand Thomas, Puteaux, and Raphael Grundman, St. Arnould, both of France, assignors to Technip Geoproduction, Paris and Engrenages et Reducteurs Citroen-Messian-Durand, Velizy Villacoublay, both of, France

Filed Nov. 27, 1987, Ser. No. 125,981
Claims priority, application France, Nov. 26, 1986, 86 16504
Int. Cl.[4] E02D *21/00*
U.S. Cl. 405—198 **16 Claims**



1. In a jack-up oil platform having a hull, and legs mounted to said hull for supporting the hull on the sea floor, said legs and said hull movable relative to one another, a suspension device connected between said hull and said legs for moving said legs and said hull relative to one another, said device comprising:

a driving mechanism including respective racks extending along at least a portion of each of said legs, at least one output pinion meshing with each of said racks, an electric motor operatively connected to each said output pinion for rotating each said output pinion, and a respective speed reducer connected to and coupling each said electric motor and a respective said output pinion;

a structural support supporting said driving mechanism on said hull, said structural support including at least one bearing pivotally supporting each said speed reducer so as to allow said speed reducer to pivot relative to said structural support when shock is imparted thereto through the output pinion connected thereto; and

energy absorbing means connected to each said speed reducer for absorbing shock imparted to said driving mechanism through each said output pinion thereof,

said energy absorbing means comprising respective support means associated with each said speed reducer and having an axis about which the support means is torsionally elastically yieldable, and connecting means connected between each said support means and the speed reducer associated therewith for transmitting pivotal movement of said speed reducer into torsion about said axis of said support means, each said support means secured in the device so as to elastically deflect about the axis thereof when said pivotal movement is transmitted thereto by said connecting means.

4,880,337

MACHINE CUTTER

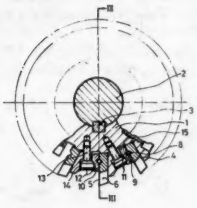
Antonio Tua Espallargas, Barcelona, Spain, assignor to Fabricacion De Herramientas Y. Utensilios, S.A., Spain

Filed Sep. 11, 1987, Ser. No. 96,395

Claims priority, application Spain, Jul. 23, 1986, 8600514

Int. Cl.[4] B23C *5/20*

U.S. Cl. 407—40 **3 Claims**



1. A machine cutter having a cylindrical supporting head, a plurality of slots provided in a lateral surface of the head, a plurality of cutting blades disposed in the slots, and means for retaining and securing the cutting blades in the slots, the retaining means comprising:

a plurality of elements, housed within the slots, adjacent to the cutting blades, each element having a longitudinal V-shaped groove, each blade having a complimentary V-shaped groove, such that when the blade is adjacent the element, the grooves form a passage, each element further having a sloped surface on a face opposite to a blade engaging face;

a screw, disposable in a bore in the body, adjacent to the element, the screw having a complimentary tapered surface for engaging the sloped element surface; and,

a longitudinal rod removably disposed in the passage provided by the mating of the complimentary V-shaped grooves, wherein the securing of the screw to the head locks the element against the cutter blade, with the element and the rod securing the blade in the head.

4,880,338

CUTTING INSERT

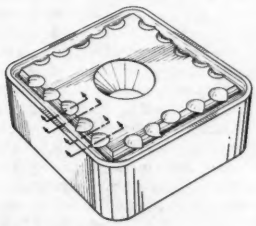
Daniel R. Stashko, Holly, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Dec. 7, 1988, Ser. No. 281,437

Int. Cl.[4] B23B *27/22*

U.S. Cl. 407—114 **11 Claims**

1. A cutting insert comprising a polygonal body having substantially parallel upper and lower surfaces including a raised seating surface having a plurality of upper surface edges, and a lower surface having a plurality of lower surface edges, a plurality of peripheral side surfaces each of which extends upwardly relative to said lower surface from one of said lower surface edges to one of a plurality of first face surfaces at one of plurality of first juncture lines each of which forms a respective cutting edge, each first face surface of said plurality of first face surfaces being lower than said raised seating surface, each of said peripheral side surfaces extending towards adjacent peripheral side surfaces to form one of a plurality of respective corners, a plurality of first inner surfaces each of which extends inwardly and downwardly from one face surface of said plurality of first face surfaces at one of a plurality of second juncture lines, each first inner surface of said plurality of first inner surfaces extending at a first angle measured relative to the plane of an adjacent face surface, said first angle forming a positive rake angle, a plurality of second inner surface each of which extends outwardly and downwardly from one of said



plurality of upper surface edges at one of a plurality of third juncture lines, each first inner surface of said plurality of first inner surfaces meeting an adjacent second inner surface of said plurality of second inner surfaces at one of a plurality of fourth juncture lines, each second inner surface of said plurality of second inner surfaces extending at a second angle measured relative to the plane of said raised seating surface, and a plurality of depressions extending into said upper surface, a surface area of each depression of said plurality of depressions only intersecting a respective first inner surface of said plurality of first inner surfaces, a respective second inner surface of said plurality of second inner surfaces, and said raised seating surface.

4,880,339

DRILL BAR WITH A CUTTER INSERT

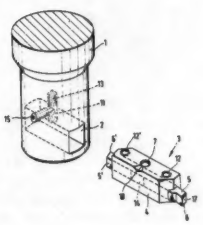
Ulrich Döge, Düsseldorf-Hellerhof, Fed. Rep. of Germany, assignor to Koyemann Werkzeuge GmbH, Erkrath, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 644,122

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 8407867[U]

Int. Cl.[4] B23B *29/02*

U.S. Cl. 408—161 **4 Claims**



1. In a drill bar having a transverse slot and comprising a cutter insert in said slot and including a housing formed with a first elongated recess, two diametrically oppositely positioned cutters inserted in said elongated recess and having inner ends and outer ends provided with main cutting edges and extended outwardly from aid housing, and clamping bolts securing said

cutters in said housing, said housing being formed with a central bore and a notch positioned midway of said elongated recess; and a centering pin adjustable along an axis thereof and limiting a floating motion of the cutter insert in a radial direction in said transverse slot, said pin having a tapered end engaged in said notch, said cutter insert further including an adjustment bolt received in said central bore and having a tapered tip having tapered edges, the improvement comprising that said cutters are each formed of a one-piece and made of high strength material, each of said cutters having an additional cutting edge (16, 16') formed at the inner end of each cutter, positioned within said first elongated recess, said housing being provided with an additional elongated recess formed between a portion of the housing into which said adjustment bolt is inserted and said first elongated recess, said additional recess being wider than said first elongated recess; and two sliding blocks positioned in said additional recess, said sliding blocks each having an inner end and outer end and being formed with a first adjusting inclined wall (29, 29') at the inner end, said tapered edges of said tip abutting against the respective said first inclined walls of said sliding blocks when said adjustment bolt is applied into said central bore to adjust said cutters relative to each other in said first elongated recess, each of said sliding blocks being provided with a stop extending into said first recess and cooperating with the respective inner end of the respective cutter, each of said cutters being formed at the outer end with an additional adjusting inclined wall (19, 19') whereby each cutter can be turned by 180° to be positioned in said recess so that said additional cutting edge will be extended outwardly from said housing whereas said additional adjusting inclined wall will abut against a respective stop.

4,880,340

SCREW CUTTER DIE HEAD

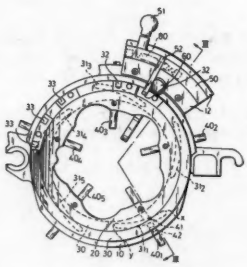
Naohiro Taki, Kohnan, and Yasuhiro Ozawa, Kasugai, both of Japan, assignors to Asada Kabushiki Kaisha, Aichi, Japan

Filed Jul. 21, 1988, Ser. No. 222,691

Claims priority, application Japan, Jul. 22, 1987, 62-112304

Int. Cl.[4] B23G *5/12*

U.S. Cl. 408—176 **2 Claims**



1. A screw cutter die head from with a center opening for an elongated cylindrical work, comprising:

an annular body portion having a plurality of radial grooves;

a ring member angularly movable relatively thereto and formed with a corresponding number of arcuate cam ridges on the side surface faced to said body portion, each of said arcuate cam ridges being helically arranged and slanted with respect to a circle passing through the center of a circumference thereof;

a corresponding number of chasers respectively having a plurality of cam recesses formed therealong and spaced apart by a predetermined distance corresponding to an inclination of the respective cam ridges so as to engage with each of said cam ridges, said chasers being held in said grooves so as to be radially movable between a screw cutting position and a retracted position in unison when said ring member is angularly moved,

each two adjacent cam ridges being spaced apart along said circumference of said circle by a distance in which a respective chaser is freed from either of said adjacent ridges;

said die head further comprising a plurality of balls, provided in said ring member and urged so as to protrude therefrom, said balls engaging respective first notches formed on respective ones of said chasers in response to said chasers being freed from a respective cam ridge so as to prevent said chasers from escaping said radial grooves and retain the chasers at the point where they are just free of the cam ridges;

such that in response to rotation of said ring member in a first direction, the cam ridges engage cam recesses of associated chasers encountered in rotation in said first direction, and, in response to rotation of said ring member in a second, opposite direction, the cam ridges engage cam recesses of associated chasers encountered in rotation in said second direction.

4,880,341

SWIVEL PLATFORM FOR A RAIL VEHICLE

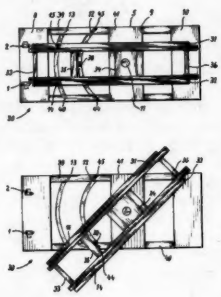
Aart A. Van Den Pol, Nijkerk, Netherlands, assignor to De Ark B.V., Nijkerk, Netherlands

Filed Apr. 20, 1988, Ser. No. 183,918

Claims priority, application Netherlands, Jan. 25, 1988, 8800161

Int. Cl.[4] B65P *1/00*

U.S. Cl. 410—1 **3 Claims**



1. A swivel platform for a rail vehicle, intended for loading a container from a road vehicle onto the rail vehicle and vice versa, comprising:

a bottom frame which must be fixed to the rail vehicle and a top frame which can swing relative to the bottom frame, via an asymmetrically positioned swing mechanism coupled to both frames, between a neutral position in which the longitudinal axis of the top frame runs approximately parallel to the longitudinal axis of the rail vehicle and a swung-out position in which the longitudinal axis of the top frame forms an angle of about 45 degrees with the longitudinal axis of the rail vehicle, said top frame being provided with two parallel container guide elements which are connected to each other by means of transverse elements, at least one of which is connected to a swing mechanism, while another is provided with a rolling means which is positioned centrally between the container guide elements and during the swing movement runs over a supporting movement path and in the swung-out position almost reaches a side edge of the rail vehicle, each of the parallel container guide elements also being provided with a rolling means which during the swing movement runs over a supporting movement path, and in which the

rolling means of the container guide elements, viewed in the transverse direction of the top frame, are placed opposite each other and, viewed in the lengthwise direction of the top frame, are placed in such a way that front rolling means of the two in the direction of swinging passes the side edge of the rail vehicle, and a rear rolling means almost reaches the said side edge;

provision is made for at least one locking element by means of which the top frame can be locked in the neutral position relative to the bottom frame; and,

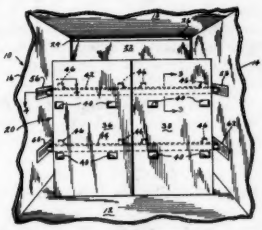
the locking element is provided with a locking pin with bevelled front face, and which can move in a tubular holder fixed on the bottom frame between a position in which a front end of the pin blocks a movement of the top frame and a position in which the top frame can pass this front end, the pin being pretensioned in the holder in such a way that, because of the bevelled front face, the part of the top frame mating with the pin is capable of pushing the pin out of the path of the top frame during the inward swing movement of the top frame.

4,880,342

MOVABLE BULKHEAD

Joseph A. Pradovic, LaCrosse, Wis., assignor to Millis Transfer, Inc., Black River Falls, Wis.

Filed Jun. 16, 1988, Ser. No. 207,397
Int. Cl.[4] B06P 7/14
U.S. Cl. 410—121 **14 Claims**



1. A cargo compartment for a vehicle, comprising:

a bottom wall;

a pair of spaced side walls extending upwardly from spaced sides of said bottom wall;

an upstanding bulkhead wall extending between said side walls, said bulkhead wall including a stationary panel and at least one movable panel which is movable between a first position wherein said movable panel is substantially coplanar with said stationary panel to define a maximum cargo volume within said cargo compartment, and a second position spaced from said bulkhead wall to define a cargo volume less than said maximum cargo volume; and

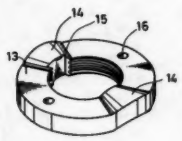
bracing means for bracing said movable bulkhead panel against movement when said movable panel is in its second position, said bracing means extending between and connectable to said spaced side walls of said compartment for bracing said movable bulkhead panel against movement, said bracing means being adapted for storage behind said movable panel when said movable panel is in its first position and said bracing means is not in use.

4,880,343

LOCK NUT HAVING LOCK MEMBER OF SHAPE MEMORY RECOVERY ALLOY

Hisao Matsumoto, Amagasaki, Japan, assignor to Matsumoto Kokan Co., Ltd., Amagasaki, Japan

Filed Sep. 30, 1987, Ser. No. 103,006
Int. Cl.[4] F16B 39/12, 39/34
U.S. Cl. 411—222 **3 Claims**



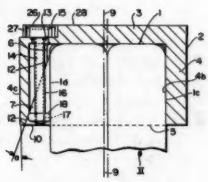
1. A lock nut comprising a lock member prepared from an alloy having a shape memory for returning to and retaining said lock member in a locking shape when said lock member is heated to a temperature above ambient temperature, said lock member being formed in said locking shape at ambient temperature and being distorted at said ambient temperature into a shape larger than said locking shape for positioning said locking member at said ambient temperature in locking position before heat is applied to return and retain said locking member in said locking shape.

4,880,344

DEVICE FOR PREVENTING LOOSENING OF A MEMBER

Max Henry, 17, rue Rabé , 8923 Pontigny, and David Callendrier, Rue des Pêcheurs, 7446 Marnaz, both of France

Filed Jul. 19, 1988, Ser. No. 221,046
Claims priority, application France, Jul. 22, 1987, 8710380
Int. Cl.[4] F16B 19/00, 33/00, 37/14
U.S. Cl. 411—374 **12 Claims**



1. In a device for preventing loosening of a prismatic member, comprising a cap adapted to cover the head of the prismatic member, said cap comprising a tranverse bottom and a cylindrical skirt in one piece with the bottom and means for locking the prismatic member received within said cap, by two opposite edges of one of its lateral faces in abutment against the inner face of the skirt, by tightening with the aid of tightening means cooperating with gripping means in the form of a spanner, of a predetermined shape and arrangement, in order to prevent any possibility of axial withdrawal of the cap, the means for locking the prismatic member in the cap are constituted in combination by a ramp inclined with respect to the longitudinal axis of the cap, placed inside the skirt, a shim placed between the ramp and the lateral face of the prismatic member sliding both the ramp and on the lateral face of the prismatic member, and means for longitudinally displacing the shim in contact with the ramp and the lateral face in order to exert a transverse force for locking the prismatic member, wherein the cylindrical skirt comprises, in its inner face, a radial notch whose cross-section is generally rectangular in form, elongated in parallel to the longitudinal axis, opening out

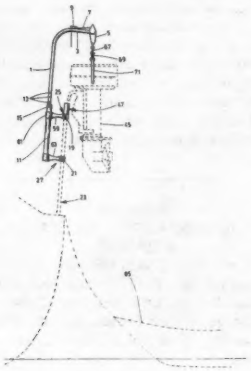
in the transverse plane of the orifice of the cap, the notch being truncated along an inclined plane with respect to the axis of the cap and constituting the ramp which converges towards the axis, moving closer thereto on the cap bottom side and moving away therefrom on the orifice side.

4,880,345

LOAD HOISTING ASSEMBLY PARTICULARLY FOR BOATS

Serge Beaupre, 45 d'Orléans, Ville Lorraine, Quebec, Canada J6Z 2S6

Filed Nov. 25, 1988, Ser. No. 276,399
Int. Cl.[4] B63B *27/18*
U.S. Cl. 414—137.9 **8 Claims**



1. An assembly for hoisting and storing an outboard motor on an upper and on a lower horizontal rail of a boat railing, said rails being spaced apart a predetermined distance; within said assembly comprises:

an elongated post having, at the upper end thereof, an outwardly turned hoisting jib provided, at the free end thereof, with a hoisting device;

a sleeve in which the post is telescopically mounted on said post and means for fixing said post to said sleeve selectively at one of a plurality locations along said post;

a flat member for supporting and storing an outboard motor and a flat stabilizing member each of said members including a pair of flat elements formed to define, when flatly applied against one another and clamped together, a through passage of a size suitable for mating with and be clamped over said horizontal rails, respectively;

means for so clamping said members on said rails;

an upright extension projecting from said supporting and storing member above said passage for supporting and storing an outboard motor;

a first connection arm solid at one end with said supporting and storing member and means for fixing said first arm at any selective location along said sleeve;

a second connection arm solid at the ends thereof respectively with said stabilizing member and means for fixing said second arm to said sleeve;

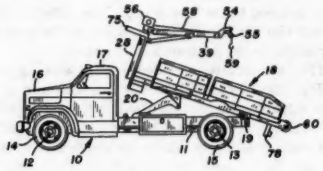
whereby, in use, at least one of said first and second arms may be moved along said sleeve relative to each other to suit said predetermined distance.

4,880,346

SELF-LOADING TRUCK AND TILT BED THEREFOR

Duane J. Brassette, P.O. Box 1202, Lake Charles, La. 70602

Filed Oct. 16, 1987, Ser. No. 109,268
Int. Cl.[4] B60P *1/34*
U.S. Cl. 414—486 **21 Claims**



1. A tilt bed for mounting on a truck equipped with lift means, said bed comprising:

(A) a frame adapted for pivotal attachment adjacent its rearward end to the rearward end of the truck frame and for pivotal attachment adjacent its forward end to the lift means of the truck;

(B) decking over said frame;

(C) a transverse front bulkhead frame extending vertically upward from the forward end of said frame;

(D) elevated hoist means supported on said bed adjacent to the forward end thereof for lifting movement therewith, said hoist means including:

(1) a vertical standard rotatably supported in said front bulkhead frame for rotation about a vertical axis,

(2) an elongated boom extending rearwardly from the top of said vertical standard and connected thereto for rotation therewith, said boom being elevated above the deck of said flat bed,

(3) winch means mounted on said standard for rotation therewith,

(4) power means for rotating said boom, and

(5) separate power means for actuating said winch,

(E) transverse roller means journaled for rotation adjacent the rearward edge of said bed; and

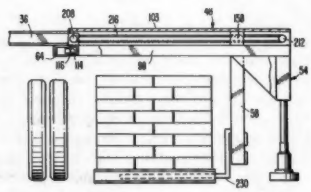
(F) control means for independently operating said lift means, boom rotation means and winch means.

4,880,347

LOAD-CARRYING ATTACHMENT FOR MOTOR VEHICLES

Jose O. Lombard, Miami, Fla., assignor to Luis A. Gigueroa, Coral Gables, Fla.

Filed Mar. 22, 1988, Ser. No. 171,892
Int. Cl.[4] B60P *1/64*
U.S. Cl. 414—542 **18 Claims**



1. A load-carrying attachment for a cargo carrying vehicle to unload cargo from or load cargo onto said vehicle when said attachment is attached to said vehicle, said attachment comprising:

a pair of spaced horizontal support beam assemblies having first and second ends, said beam assemblies being connected, said first ends of said support beam assemblies being attachable to said vehicle;

first and second leg members, said first leg member being attached to one of said support beam assemblies, said second leg member being attached to the other of said support beam assemblies;

a mast slidably attached to said beam assemblies such that said mast is movable along said beam assemblies, said mast being positioned between said beam assemblies, said mast also being rotatably attached to said beam assemblies;

a carriage slidably attached to said mast such that said carriage can slide parallel to the longitudinal axis of said mast;

first means removably attachable to said carriage for engaging a load; and

receiving means attached to said vehicle for receiving said first ends of said support beam assemblies, said receiving means extending along the sides and back of said vehicle such that said attachment may be moved around the sides and back of said vehicle;

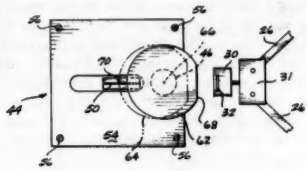
wherein said attachment is capable of unloading cargo from or loading cargo onto said vehicle when said horizontal support beam assemblies are attached to said vehicle.

4,880,348

WAFER CENTRATION DEVICE

Gregory G. Baker, and Edward F. Boyle, both of Gig Harbor, Wash., assignors to Roboptek, Inc., Gig Harbor, Wash.

Filed May 15, 1987, Ser. No. 50,951
Int. Cl.[4] B65G 47/24
U.S. Cl. 414—783 **6 Claims**



1. Apparatus for centering a wafer-like object relative to a reference point, comprising:

(a) a rotatably driven support on which the wafer-like object is positioned, a diametrical extent of the rotatably driven support being substantially less than that of the wafer-like object so that a perimeter of the wafer-like object extends beyond that of the rotatably driven support, a rotational axis of the rotatably driven support being coincident with the reference point, the rotatably driven support including an angular position sensor for producing a signal indicative of the angular position of the rotatably driven support about its rotational axis;

(b) an array of light sensors disposed adjacent the rotatably driven support, each light sensor being operative to produce a signal corresponding to the intensity of light incident on it;

(c) a light source illuminating the wafer-like object and the array of light sensors and disposed so that the perimeter of the wafer-like object is intermediate the light source and the array of light sensors and casts a shadow on said array of light sensors;

(d) a manipulator adapted to lift the wafer-like object from the rotatably driven support and to reposition it thereon; and

(e) control means connected to the array of light sensors, the angular position sensor, the rotatably driven support, and the manipulator, and responsive to the signals produced by the angular position sensor and the array of light sensors, for:

(i) causing the rotatably driven support to rotate, so that substantially the entire perimeter of the wafer-like object passes between the light source and the array of light sensors;

(ii) in response to the signals produced by the light sensors in the array and by the angular position sensor, determining the angular position of the rotatably driven support where the perimeter of the wafer-like object is at one of a maximum and a minimum displacement relative to the reference point;

(iii) determining a distance proportional to said one of the maximum and the minimum displacement, that the wafer-like object should be moved to bring a center of the wafer-like object into coincidence with the reference point; and

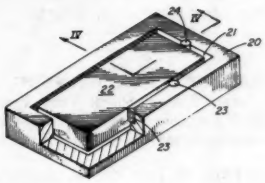
(iv) causing the manipulator to lift the wafer-like object and to move it along said distance prior to returning it to the rotatably driven support.

4,880,349

METHOD FOR LOCATING AND SUPPORTING CERAMIC SUBSTRATES

Daniel A. Woodward, West Palm Beach, Fla., assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 945,567, Dec. 23, 1986, Pat. No. 4,784,377.
This application May 23, 1988, Ser. No. 197,574
Int. Cl.[4] B65G 47/00
U.S. Cl. 414—786 **5 Claims**



1. A method for locating and supporting a substrate, comprising the steps of:

(a) placing a substrate on a top surface of an intermediate plate movably supported on a support member;

(b) applying a vacuum to said top surface of said intermediate plate;

(c) applying a pressure to a support surface of said support member to provide an air bearing for supporting said intermediate plate;

(d) moving said intermediate plate towards a locating means fixedly mounted on said support member;

(e) contacting said substrate with said locating means; and

(f) applying a vacuum to said support surface of said support member when said substrate is located to hold said intermediate plate.

4,880,350

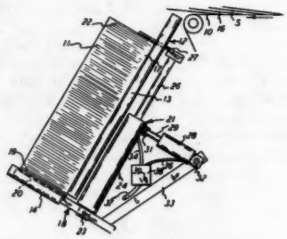
METHOD AND APPARATUS FOR HANDLING STACKS OF SHEETS

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Sep. 6, 1988, Ser. No. 240,671
Int. Cl.[4] B65H 31/30
U.S. Cl. 414—790.2 **9 Claims**

1. In a sheet stacker wherein sheets are formed into a stack relationship having a stack top and with the sheet edges disposed along an inclined plane and on and in contact with an inclined support extending along said inclined plane and with the sheets stacked on a stack carrier which engages one end of

the stack while the stack is being formed and which moves the stack downwardly along the inclined direction of said inclined support, the improvement comprising a clamp assembly attached to said carrier for movement both relative to and with said carrier, said clamp assembly including a movable portion extending across and being movable along said inclined plane for engaging said top of said stack and being in contact with said stack top at the intersection of said top and the inclined



plane of said edges, displacement means for moving said assembly relative to said carrier to thereby position said movable portion for engaging said stack opposite end, and said clamp assembly including a force applicator for pressing said movable portion against said stack opposite end and thereby clamp said stack relative to said carrier for the movement of said stack downwardly along said inclined support and thereby prevent said sheet edges from turning upward.

4,880,351

VARIABLE CAPACITY TURBINE

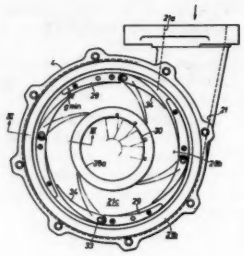
Kazuo Inoue; Osamu Kubota; Shunji Yano; Fusao Tateishi; Etsuo Noda; Koji Yamaguchi, and Tsuneo Endo, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1987, Ser. No. 54,499

Claims priority, application Japan, May 30, 1986, 61-124996; May 30, 1986, 61-124997; May 30, 1986, 61-124998

Int. Cl.[4] F01D *17/16*

U.S. Cl. 415—164 **17 Claims**



1. A radial in-flow turbine comprising a turbine wheel, a turbine scroll passage defined in a turbine casing around the turbine wheel for introduction of gas to the turbine wheel, and an axial central passage defined in the turbine casing for ejection of gas from the turbine wheel. wherein:

a plurality of variable nozzles, having an axial width, are arranged concentrically with respect to the turbine wheel and inside of the turbine casing and outside of an annular throat section defined inside the turbine casing concentric to the turbine wheel and having a locally minimum axial width less than said nozzle axial width, said variable nozzles are defined by fixed vanes and moveable vanes.

4,880,352

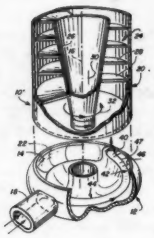
CENTRIFUGAL LIQUID PUMP

Jerome K. Aarestad, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 23, 1987, Ser. No. 124,071

Int. Cl.[4] F04D *29/44*

U.S. Cl. 415—182.1 **22 Claims**



1. A centrifugal liquid pump, comprising:

a housing section including an intake cavity defined by an annulus about a rotational axis of the pump;

an impeller section in communication with and coaxially of the intake cavity of the housing section;

impeller means in the impeller section rotatable about said axis; and

ramp means defined by wall means in the annulus of the housing section about said axis including an axial slope component such that liquid rotating in the intake cavity will be given an axial component of motion toward the impeller section and a radial slope component such that liquid rotating in the intake cavity will be given a radially inward component of motion toward the pump axis in response to centrifugal movement about the annulus.

4,880,353

DEVICE FOR CONVERTING THE ENERGY OF A FLOWABLE MEDIUM INTO A TORQUE

Hermann Dettwiler, Hauptstrasse 45, Ziefen, Switzerland CH-4417

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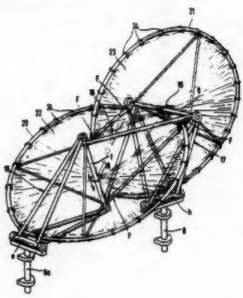
Claims priority, application Switzerland, Mar. 17, 1987, 999/87

Int. Cl.[4] B63H *1/30*

U.S. Cl. 416—83 **18 Claims**



1. A device for converting the energy of a flowable medium

into a torque, or vice versa, comprising a pair of linkages supported by a common mounting means for mounting said linkages such that one of said linkages is positioned on one side of a first imaginary plane which contains said mounting means and the other of said linkages is positioned on an opposite side of said first plane so as to form a mirror image of said one linkage, said mounting means including a first rotatable axle which is perpendicular to said first plane and which extends from said one side thereof to said opposite side thereof and a second rotatable axle which is perpendicular to said first plane and which extends from said one side thereof to said opposite side thereof, said second axle being parallel to said first axle and spaced a predetermined distance therefrom, said one linkage including a first link member pivotally connected to said first axle by a first pivot pin attached to said first axle so as to be conjointly rotatable therewith, whereby said first link member is pivotable about said first pivot pin in response to the rotation of said first axle, a second link member pivotally connected to said second axle by a second pivot pin attached to said second axle so as to be conjointly rotatable therewith, whereby said second link member is pivotable about said second pivot pin in response to the rotation of said second axle, and a third link member pivotally connected to said first link member by a third pivot pin and to said second link member by a fourth pivot pin such that when said first link member extends from said first axle in a direction which is perpendicular to said first plane said first, second and third link members all lie in a second imaginary plane which is perpendicular to said first plane and such that when said first, second and third link members all like in said second plane said first pivot pin is parallel to said first and second planes, said second pivot pin is parallel to said first plane and perpendicular to said second plane, said third pivot pin is parallel to said first plane and perpendicular to said second plane, and said fourth pivot pin is arranged at an inclined angle relative to said first plane and is parallel to said second plane, and said other linkage including a fourth link member pivotally connected to said first axle by a fifth pivot pin attached to said first axle so as to be conjointly rotatable therewith, whereby said fourth link member is pivotable about said fifth pivot pin in response to the rotation of said first axle, a fifth link member pivotally connected to said second axle by a sixth pivot pin attached to said second axle so as to be conjointly rotatable therewith, whereby said fifth link member is pivotable about said sixth pivot pin in response to the rotation of said second axle, and a sixth link member pivotally connected to said fourth link member by a third pivot pin and to said fifth link member by an eighth pivot pin such that when said fourth link member extends from said first axle in a direction which is perpendicular to said first plane said fourth, fifth and sixth link members all lie in said second plane and such that when said fourth, fifth and sixth link members all lie in said second plane said fifth pivot pin is parallel to said first and second planes, said sixth pivot pin is parallel to said first plane and perpendicular to said second plane, said seventh pivot pin is parallel to said first plane and perpendicular to said second plane, and said eighth pivot pin is arranged at an inclined angle relative to said first plane and is parallel to said second plane; a first set of driving elements attached to said one linkage; and a second set of driving elements attached to said other linkage.

4,880,354

WARMING STRUCTURE OF GAS TURBINE ROTOR

Mitsuo Teranishi; Haruo Urushidani; Hajime Toriya, and Shoji Ebine, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Power Engineering Co., Ltd., Hitachi, both of, Japan

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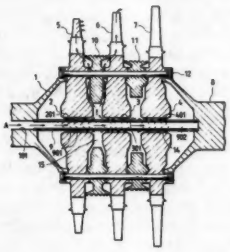
Claims priority, application Japan, Nov. 25, 1987, 62-295302
Int. Cl.[4] F01D *5/08*
U.S. Cl. 416—95 **9 Claims**

1. In a gas turbine rotor having a structure wherein air extracted from an air compressor at a stage of from intermediate to final stages thereof is introduced into a turbine blade of the rotor through a cooling passage formed inside the rotor, said rotor having a warming structure comprising:

a tubular member, having a plurality of through holes arranged in an elongated side wall thereof and inserted in central holes formed in rotor disks so as to form a space between said central holes of said rotor disks and said tubular member, said plurality of through holes being



formed so as to face the inner peripheral walls of said central holes of said rotor disks;

a compressor air supply passage provided to supply the extracted compressor air to said tubular member; and

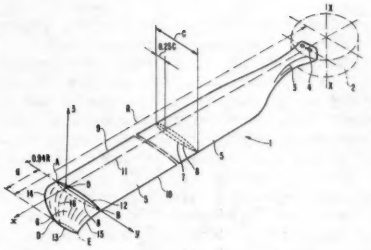
an air flow passages for introducing the extracted compressor gas, having been injected to said inner peripheral walls of said rotor disks through said plurality of through holes of said tubular member, to said turbine blade.

4,880,355

BLADE WITH CURVED END FOR A ROTARY AIRFOIL OF AN AIRCRAFT

Alain E. Vuillet, Bouc Belair; Jean J. Philippe, Versailles, and Andrë Desopper, Garches, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris and Office National D'Etudes et de Recherches Aerospatiales, Chatillon, both of, France

Filed Jun. 24, 1988, Ser. No. 211,420
Claims priority, application France, Jun. 29, 1987, 87 09150
Int. Cl.[4] B64C *27/46*
U.S. Cl. 416—228 **10 Claims**



1. Blade for the rotating airfoil of an aircraft having an attachment for fixing to a hub, a current part having a leading edge and a trailing edge and whose profile has a chord of constant or evolutive length C, and a tip whose span is less than 10 percent of the total span of the blade, which extends from said current part outwardly and whose leading edge extends from the leading edge of said current part rearwardly in a sweep, said tip being in addition downwardly slanted, wherein said downward slant of said blade tip extends over the entire length of this tip and is continuous from the connection

from the current blade part as far as the end edge of said tip so that said tip follows a curvature such that its extrados is convex and its intrados is concave, the downward curvature of said blade tip being at least approximately of parabolic trend, the extensionin ssid tip of a reference line of the current part merging with the controlled pitch variation axis of said blade, has a substantially parabolic trend, referred to a system of orthogonal axes Ox, Oy and Oz, whose origin O is situated at the connection of the reference line of said current blade part and of the reference line of said blade end, the axis Ox being aligned with the reference line of said current part and being oriented outwardly of the blade, whereas the axis Oy merges with the chord of the connection profile between said current part and said end and is oriented from the leading edge to the trailing edge and the axis Oz is oriented upwardly, namely from the intrados to the extrados of the blade, wherein said reference line of said blade tip is contained in a plane xOY passing through the axis Ox and whose plot OY in the plane yOz forms an angle γ with the axis Oy and, in the plane xOY, the equation of said reference line of said blade tip is a parabolic trend function in which the coefficient of the highest degree term depends on the angle γ.

4,880,356

METHOD OF CONTROLLING WOBBLE PLATE TYPE COMPRESSOR

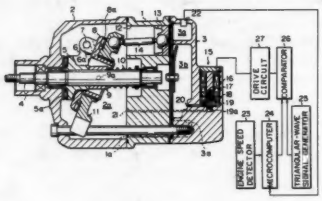
Shinichi Suzuki; Soukichi Hibino; Takahiro Hamaoka, and Masaki Ohta, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Aug. 9, 1988, Ser. No. 230,332

Claims priority, application Japan, Aug. 10, 1987, 62-200532

Int. Cl.[4] F04B *1/26*; B60H *1/32*; F25B *1/02*

U.S. Cl. 417—53 **5 Claims**



1. A method of controlling the operation of a variable displacement wobble plate type compressor provided with:

a cylinder block having formed therein, a plurality of cylinder bores to receive therein compressor pistons;

a housing means arranged on axially opposite ends of the cylinder block for defining therein a suction chamber for a low pressure refrigerant gas to be compressed, a discharge chamber for a compressed high pressure refrigerant gas, and a crankcase chamber for receiving a pressure responsive displacement varying means including a drive shaft connectable to a rotative drive source means, a drive plate mounted around the drive shaft and capable of rotating with the drive shaft and varying an inclination angle thereof with respect to a plane vertical to the axis of the drive shaft and a wobble plate non-rotatably supported by the drive plate, the wobble plate inclining with the drive plate in response to a pressure difference between the crankcase chamber and the suction chamber, and connected to the compressor pistons via piston rods to cause a reciprocating motion of the compressor pistons with variable stroke to thereby vary the displacement of the compressor;

a solenoid-operated control valve means arranged in a pressure control passageway means extending from the discharge chamber to the crankcase chamber for changing an extent of fluid communication between the crankcase and discharge chambers; and

a control means for electrically controlling the operation of the solenoid-operated control valve, comprising the steps of:

(a) generating a command signal for a rapid reduction in displacement of the compressor by said control means in response to a demand for a reduction of the displacement of the compressor;

(b) responding to the command signal, supplying the solenoid-operated control valve with an electrical energizing signal having a predetermined intensity greater than the intensity required to maintain a predetermined reduced displacement of the compressor to increase the extent of fluid communication between the crankcase and discharge chamber during a predetermined initial part of a time period in which the demand for a reduction of the displacement of the compressor is required; and

(c) reducing the electrical energizing signal supplied to the solenoid-operated control valve to the intensity required to maintain the predetermined reduced displacement of the compressor for the remaining part of the time period in which demand for the reduction of the displacement of the compressor continues.

4,880,357

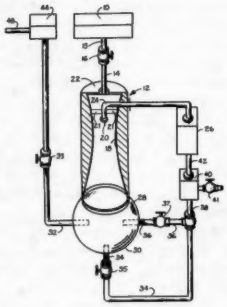
METHOD AND APPARATUS FOR PRODUCING HIGH VACUUM

Terrence L. Mathers, 7301 Plum St., New Orleans, La. 70118

Filed Jun. 27, 1988, Ser. No. 211,884

Int. Cl.[4] F04B *23/14*

U.S. Cl. 417—77 **18 Claims**



12. A method for obtaining sub-atmospheric pressures comprising:

a. connecting a venturi tube to a space in which a sub-atmospheric pressure is desired, said venturi tube having a first end and a second end for reducing pressure in said space, said first end of said venturi tube being connected to said space,

b. spraying fluids from a nozzle located in said first end of said venturi tube through the second end of said venturi tube,

c. collecting said fluids in a collection chamber means connected to said second end of said venturi chamber for receiving fluids sprayed from said nozzle, said collection chamber means having at least two outlet means, said outlet means spaced apart a distance sufficient to locate one of said outlet means at the bottom of said collection chamber means when said collection chamber means is rotated,

d. pumping said fluids exiting from said second end of said venturi tube to said nozzle to be sprayed through said nozzle.

4,880,358

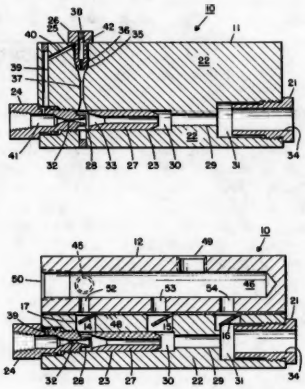
ULTRA-HIGH VACUUM FORCE, LOW AIR CONSUMPTION PUMPS

Clifford S. Lasto, Woodbridge, Conn., assignor to Air-Vac Engineering Company, Inc., Milford, Conn.

Filed Jun. 20, 1988, Ser. No. 209,288

Int. Cl.[4] F04F 5/00

U.S. Cl. 417—174 **4 Claims**



1. A multi stage ejector assembly comprising a solid elongate housing, a longitudinal cylindrical bore through said housing comprising a first venturi pump having a first converging-diverging venturi inlet nozzle opening through a first vacuum chamber in said cylindrical bore into the converging entrance of a first exit passage which opens through a second vacuum chamber into a second exit passage communicating with an outlet end of the cylindrical bore, first and second transverse bores inwardly from a side of the housing and each opening into said cylindrical bore at said first vacuum chamber, and a third transverse bore inwardly from a side of the housing and opening into said cylindrical bore at said second vacuum chamber, said first transverse bore comprising a second venturi pump having a second venturi inlet nozzle having an air flow consumption which is from about 5 to 15 times smaller than the air flow consumption of said first venturi inlet nozzle, said second venturi inlet nozzle opening through a maximum vacuum chamber into a converging-diverging venturi exit passage which opens into said cylindrical bore at the first vacuum chamber of the first venturi pump adjacent said converging entrance of the first exit passage, a fourth transverse bore inwardly from a side of the housing and opening into the vacuum chamber of said second venturi pump, air-inlet means communicating with the venturi inlet nozzles of both said first and second venturi pumps, a vacuum manifold connected to said housing and having a vacuum chamber communicating with each of said second, third and fourth transverse bores and having a vacuum flow inlet designed to be connected to a container to be evacuated, and independent vacuum-sensitive valve means supported between said vacuum manifold and each of said second and third transverse bores to sequentially close communication between the first and second vacuum chambers of the longitudinal bore and the chamber of the manifold when the vacuum force within the manifold increases to a value greater than the vacuum force within said first and second vacuum chambers, the chamber of the manifold being open to the fourth transverse fore and to the vacuum chamber of the second venturi pump at all times in order to develop a high vacuum force in the manifold chamber, and the chamber of the manifold being open to the second and third transverse bores only when the vacuum force within the manifold chamber is low, to provide a high vacuum flow through the manifold chamber until the vacuum force therewithin increases.

4,880,359

SUMMATION POWER OUTPUT REGULATING SYSTEM FOR AT LEAST TWO HYDROSTATIC TRANSMISSIONS

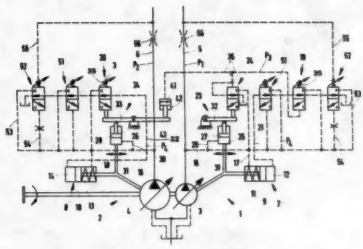
Hermann Hoffmeister, Nersingen; Klaus Puvogel, Ulm, and Reinhold Schniederjan, Neu-Ulm, all of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,762

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3638889

Int. Cl.[4] F04B 49/08

U.S. Cl. 417—216 **3 Claims**



1. A summation power output regulating system for hydrostatic machines of at least two hydrostatic transmissions, driven by a common drive, with a hydraulic control device, having a control piston, for each of the first and the second machines, wherein the second machine is provided with a hydraulic power output regulator which regulates the pressure acting on the control device in dependence upon the power output from the second machine, and wherein a control pressure depending on the working pressure of the first machine is transmitted by a hydraulic actuator to said power output regulator, characterized in that the first machine is provided with a first power output measuring valve which determines the power output of the first machine and controls the control pressure (P_3) in dependence upon the power output of the first machine, wherein said first power output measuring valve includes a piston slide and is operatively connected with a piston acted on by the operating pressure (P_1, P_2) of the associated machine, which is arranged in the associated control piston so that it can move transversely of and be adjusted with the control piston, wherein, arranged between the piston slide of said measuring valve and said piston, a lever arm is mounted to pivot about a fixed axis extending transversely of the axis of the associated control piston and transversely of the valve slide of said measuring valve (34).

4,880,360

VARIABLE DISPLACEMENT COMPRESSOR WITH BIASED INCLINED MEMBER

Kiyoshi Terauchi, Gunma, and Masaharu Hiraga, Saitama, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed May 18, 1988, Ser. No. 195,159

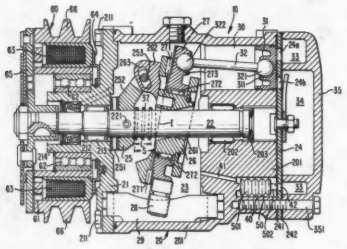
Claims priority, application Japan, May 19, 1987, 62-73666[U]

Int. Cl.[4] F04B 1/26

U.S. Cl. 417—222 **11 Claims**

1. In a refrigerant compressor including a compressor housing having a central portion, a front end plate at one end and a rear end plate at its other end, said housing having a cylinder block provided with a plurality of cylinders and a crank chamber within said cylinder block, a piston slidably fitted within each of said cylinders and reciprocated by a drive mechanism

including a drive shaft rotatably supported in said housing, an input drive rotor coupled to said drive shaft and rotatable therewith, and coupling means for drivingly coupling said rotor to said pistons such that the rotary motion of said rotor is converted into reciprocating motion of said pistons, said coupling means including an inclined member having an inclined surface disposed at an incline angle relative to said drive shaft, said incline angle of said inclined member being adjustable between a maximum angle and a minimum angle in response to pressure changes in said crank chamber to vary the stroke length of said pistons and the capacity of the compressor, said rear end plate having a suction chamber and a discharge chamber, pressure control means for controlling pressure of said crank chamber, the improvement comprising:



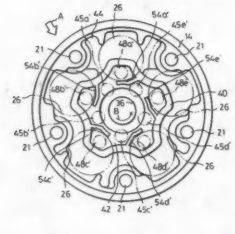
elastic means for applying a force urging said inclined surface of said inclined member toward a decreased incline angle, said elastic means applying said force to said inclined member only when said inclined surface is positioned at an incline angle between its maximum incline angle and a predetermined incline angle, said predetermined incline angle being greater than said minimum incline angle whereby said elastic means apply no force to decrease the incline angle of said inclined surface when said inclined surface is positioned at an incline angle less than said predetermined incline angle.

4,880,361

MULTI-PISTON SWASH PLATE TYPE COMPRESSOR WITH ARRANGEMENT FOR INTERNAL SEALING AND FOR UNIFORM DISTRIBUTION OF REFRIGERANT TO CYLINDER BORES

Hayato Ikeda; Kazuhiro Ohta, and Hisato Kawamura, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed May 12, 1988, Ser. No. 193,367
Claims priority, application Japan, May 13, 1987, 62-114451
Int. Cl.[4] F04B *1/16, 1/00*
U.S. Cl. 417—269 **2 Claims**



1. A multi-piston swash plate type compressor for an air-conditioning system used in a vehicle such as an automobile, which comprises:

a pair of axially combined front and rear cylinder blocks forming therein a plurality of cylinder bores and a swash plate chamber;

a pair of front and rear housings arranged at the axial end faces of said combined cylinder blocks, each housing having therein an inner suction chamber for a refrigerant prior to compression and an outer discharge chamber for a refrigerant after compression;

an annular partition wall arranged in each of said front and rear housings for isolating said inner suction chamber from said outer discharge chamber;

valve plates interposed between said front and rear housings and the axial end faces of said combined cylinder blocks, respectively;

a plurality of tightening screw bolts for axially and hermetically assembling said front and rear housing, said valve plates and said combined cylinder blocks as an integrated unit;

a drive shaft extending axially through said swash plate chamber of said combined cylinder blocks;

a swash plate mounted on said drive shaft within said swash plate chamber;

a plurality of pistons engaged with said swash plate so as to be reciprocated in said cylinder bores;

a plurality of inlet passageways extending through said combined cylinder blocks and said valve plates for communication between said swash plate chamber and the suction chambers of said front and rear housings; and

internal sealing and guiding means arranged in each of said front and rear housings for providing a hermetic seal between the axial end faces of said combined cylinder blocks and said valve plates, respectively, and for providing a substantially uniform distribution of refrigerant from said suction chamber to said cylinder bores,

said internal sealing and guiding means including a plurality of rib members which are individually provided in each of said front and rear housings for rigidly holding said valve plates against a high pressure of said refrigerant after compression within the cylinder bores of said combined cylinder blocks,

wherein all of said rib members are integrally extended from the inner side wall portion of said annular partition wall so that they guide the refrigerant flows toward the corresponding cylinder bores, respectively, and wherein said rib members are arranged to guide refrigerant flows entering said suction chamber through said inlet passageways to carry out said uniform distribution of refrigerant, thereby reinforcing a hermetic seal between the axial end faces of said combined cylinder blocks and said valve plates, respectively, while sufficiently lubricating all of said cylinder bores with a lubricating oil included in the uniformly distributed refrigerant.

4,880,362

ROTOR WITH STABILIZING MAGNETS

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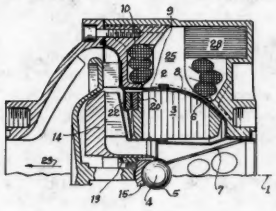
Filed May 24, 1988, Ser. No. 198,004
Int. Cl.[4] F04B *17/02*
U.S. Cl. 417—365 **7 Claims**

1. A pump-motor-unit with a dry and a wet compartment separated by a magnetically permeable spherical wall (8), the dry compartment comprising a magnetic device (25,28) which produces a rotating magnetic field causing rotation of a spherical armature (3,33) rotatably and tiltably supported in its center, mounted in the wet compartment, that armature forming a rotary unit with an impeller (14,34,44) which contains a bearing cap (15) forming together with a stationary convex spherical counterpart (5) a spherical step bearing which supports the rotary unit (3–14, 33–34) radially and in the axial direction towards the stationary couterpart (5) of the cap (15), said stationary counterpart (5) being supported by the casing on a stationary structure (7), the rotary unit (3–14,33–34) being

pushed during operation by the axially directed vector of the magnetic forces generated by said magnetic device (25,28) toward said magnetic device (25,28) counteracting movement of the rotary unit (3–14,33–34) in the direction (23,35) away from the magnetic device (25,28), said rotary unit (3–14,33–34) comprising a concentric annular permanent magnet (10,20,30)



forming an unobstructed gap (6*a*) with a stationary annular permanent magnet (12,22,32) mounted inside the wet compartment, both magnets being magnetized perpendicular to the surface of said gap and both magnets facing the gap with their sides of the same polarity thereby generating thrust to stabilize the rotary unit (3–14,33,34) and to prevent axial movement.

4,880,363

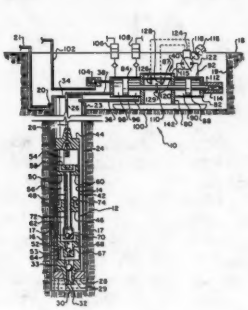
WELL PUMP SYSTEM

John H. Holland, Norman, Okla., assignor to John and Martin Holland and Associates, Norman, Okla.

Division of Ser. No. 906,260, Sep. 11, 1986, Pat. No. 4,778,355, which is a continuation-in-part of Ser. No. 615,300, May 30, 1984, Pat. No. 4,611,974. This application Jun. 6, 1988, Ser. No. 202,413

Int. Cl.[4] F04B *47/04*

U.S. Cl. 417—390 **5 Claims**



1. Power transfer apparatus for causing vertical reciprocation of piston means in a downhole well pump operatively disposed in a wellbore, said well pump having a driving fluid chamber therein adapted to receive a quantity of driving fluid to responsively cause said piston means to lift, and to discharge the received driving fluid during downward movement of said piston means, said apparatus comprising:

a driving fluid housing having first and second opposite ends;

a drive piston disposed in said housing and dividing the interior thereof into a first chamber disposed between said drive piston and said first end of said housing, and a second chamber disposed between said drive piston and said second end of said housing;

a driving fluid pipe having a first end in fluid communication with said first chamber, and a second end adapted for connection to said well pump in fluid communication with said driving fluid chamber of said well pump,

said first chamber and said driving fluid pipe, when operatively connected to said driving fluid chamber of said well pump, being adapted to be filled with a first driving fluid;

a driving fluid pump having an inlet adapted to receive a second driving fluid from a source thereof, and an outlet adapted to discharge the received second driving fluid; and

means for alternately:

(1) causing said driving fluid pump to draw second driving fluid from said source thereof and discharge second driving fluid into said second chamber to force said drive piston toward said first housing end to thereby force first driving fluid out of said first chamber and into said driving fluid pipe to force first driving fluid from within said driving fluid pipe into said driving fluid chamber of said well pump to cause said piston means in said well pump to rise, and

(2) permitting said piston means in said well pump to fall to thereby force first driving fluid from said driving fluid chamber into said driving fluid pipe, and from within said driving fluid pipe into said first chamber, in a manner moving said drive piston toward said second housing end and responsively forcing second driving fluid outwardly from said second chamber and inwardly through said inlet of driving fluid pump to assist in driving the same during downward movement of said piston means in said well pump.

4,880,364

PORTABLE ELECTRIC BLOWER

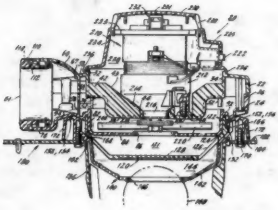
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Craig A. Seasholtz, Avis, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Continuation of Ser. No. 64,768, Jun. 19, 1987, Pat. No. 4,797,072. This application Aug. 25, 1988, Ser. No. 237,686

The portion of the term of this patent subsequent to Jan. 2, 2006, has been disclaimed.

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—423.1 **5 Claims**



1. An air blower, comprising:

an external housing, an air inlet into the housing, an air outlet from the housing, a motor in the housing and a fan in the housing driven by the motor for drawing air into the housing inlet and for blowing air out the housing outlet;

a motor support located in the housing for supporting the motor and shaped and disposed in the housing for providing air separation between the motor and the fan;

the housing including a chamber around the fan and at the side of the motor support, and the chamber communicating with the outlet from the blower;

further comproises the inlet to the housing including an inlet opening through which air is drawn into the housing and the fan being disposed near the inlet opening;

a cup shaped intake shield sealingly attached to the housing and extending past the inlet to the housing, where the intake shield extends past the inlet opening, the intake

shield being spaced from the housing and from the housing inlet;

air passes means through the intake shield for enabling air to be drawn past the intake shield and into the housing inlet;

a support for the housing and the cup shaped intake shield , the support comprising a surface having an openning in it and the opening being defined by a periphery around the opening in the surface, the intake shield being disposed over the opening in the surface and partially extending into the opening, and a cup shaped adapter disposed in the opening in the surface, covering the periphery of the opening in the surface and supported to the surface, and the adapter also receiving in it the intake shield and being spaced from the air passage means of the intake shield; a generally air sealing connection between the adapter and the surface at the periphery of the opening, on the one hand, and between the adapter and the intake shield, on the other hand, and the intake shield being further sealed to the housing;

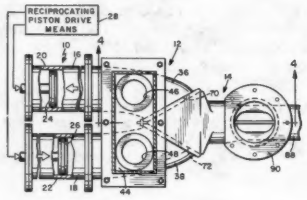
an inlet opening through the adapter communicating with the space between the adapter and the intake shield for defining an air pathway from the adapter to the intake shield.

4,880,365

CEMENT PUMP WITH REMOVABLE DISCHARGE CHAMBER CARTRIDGE

Richard D. Austin, 18414 Buckthorne Rd., Devore, Calif. 92407

Filed Feb. 4, 1988, Ser. No. 152,042
Int. Cl.[4] F04B *15/02, 21/02*
U.S. Cl. 417—531 **4 Claims**



1. A double acting concrete pump, comprising:

first and second pump cylinders with a respective piston slidable back and forth in each of the cylinders, the cylinders having outlets at one end for receiving and discharging fluid to be pumped;

drive means operatively connected to the pistons for simultaneously driving them in opposite directions to reciprocate back and forth in their respective cylinders;

a connecting manifold for selectively connecting the outlet of each cylinder to a supply of fluid to be pumped, the manifold having first and second pumping chambers in flow communication with the first and second cylinder outlets, respectively, each pump chamber having an inlet for connection to a supply of fluid to be pumped and a discharge outlet for flow of pumped material out of the chamber;

the connecting manifold having a generally wedge-shaped indent at its outer end, having opposite side walls forming a V-shape and upper and lower walls, the respective pump chamber outlets being located in opposite side faces of said indent;

a discharge manifold of corresponding wedge shape to said indent for connecting each of the pump chamber outlets to a delivery outlet, the discharge manifold having a discharge chamber, and a pair of inlets for alternately connecting the discharge outlet of each pump chamber to the discharge chamber while isolating the other pump chamber in response to pumping action of the respective pistons, the discharge manifold being formed as a unit separable from the remainder of the pump; said discharge chamber inlets being located in respective opposite side faces of said wedge-shaped discharge manifold and being positioned for alignment with the respective pump chamber outlets when the discharge manifold is secured in the indent;

and releasable securing means for releasably securing the discharge manifold unit to the connecting manifold with the pump chamber outlets in communication with the discharge chamber;

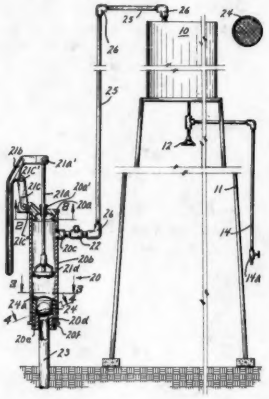
the connecting manifold indent comprising means for mating engagement with said discharge manifold with said respective pump chamber outlets aligned with the respective discharge chamber inlets.

4,880,366

PLASTIC HAND LIFT PRESSURE PUMP

Larry A. Stinson, R. 4, P.O. Box 571, Mount Vernon, Ind. 47620

Filed Sep. 6, 1988, Ser. No. 240,675
Int. Cl.[4] F04B *19/22*
U.S. Cl. 417—555.1 **1 Claim**



1. A pressure pump comprising a hollow body portion having open ends and including a built-in check valve received in a bushing at one end thereof and means limiting movement of said built-in check valve, a plug member overlying said body portion and disposed within the other end thereof, a plunger rod extending through said plug member, a handle pivotally secured to an end of said plunger rod, and linkage means interconnecting said handle and said plug member, where said hollow body portion including said built-in check valve, said bushing and said limiting means, said plug member, said plunger rod, said handle and said linkage means are fabricated from thermoplastic material, and where said built-in check valve includes a mineral filled ball also fabricated from thermoplastic material.

4,880,367

RIGID SUPPORT STRUCTURE FOR SINGLE SCREW COMPRESSORS

Thomas W. Bein, 1283 Swan Dr., Annapolis, Md. 21401

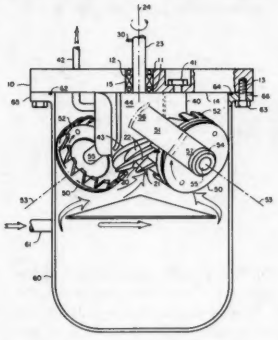
Continuation-in-part of Ser. No. 834,991, Feb. 28, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,323
Int. Cl.[4] F04C *18/20*
U.S. Cl. 418—107 **32 Claims**

1. A single screw compressor for varying the pressure of a gas, comprising:

a mainrotor formed with a plurality of threads:

a central structure having a central bore, said central bore cooperating with said mainrotor forming at least one compression chamber;

a gaterotor shaft having an inward end and an outward end, said inward fend attached to said central structure;



a gaterotor having teeth in meshing relation with said mainrotor threads, said gaterotor rotationally mounted on said gaterotor shaft; and,

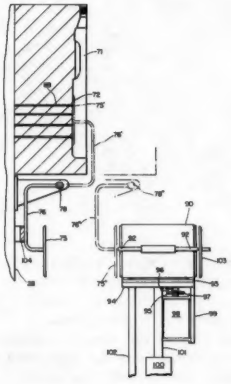
an elongate support arm attached at an inward end to said central structure and at an outward end to said gaterotor shaft.

4,880,368

IN-MOLD LABEL TRANSFER APPARATUS

Siegfried C. Hasl, 80 Liberty Corner, Warren, N.J. 07060, and Charles J. Lisnet, Westport, Conn., assignors to Siegfried C. Hasl, Warren, N.J.

Filed Oct. 24, 1983, Ser. No. 544,986
Int. Cl.[4] B29B *11/06*; B65C *9/14*
U.S. Cl. 425—116 **17 Claims**



1. An in-mold label transferring apparatus for placing labels onto a mold surface on at least one of two relatively movable mold halves of a molding machine, comprising:

a magazine means for storing a stack of pre-cut labels with the front label of the stack accessible to be removed therefrom;

a label applicator head;

a rod, said head being mounted on said rod;

a plate on which said one o the movable mold halves is mounted;

a shaft having a longitudinal axis, said rod being connected to said shaft for movement about the said longitudinal axis of the shaft and with said head spaced from said shaft, said shaft being mounted to said plate to move with said plate and for rotational movement about the longitudinal axis of said shaft between a first position to place said head against the mold surface for delivery of a label to the mold surface and a second position to place said head and said rod completely outside of the space between the facing mold halves for receiving a label; and

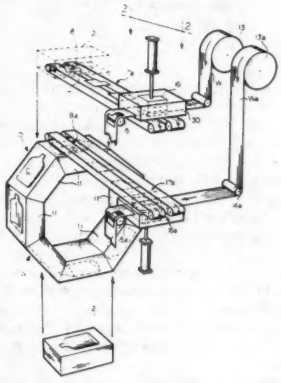
a power means for rotating said shaft to move said rod and said head between the first and second positions.

4,880,369

APPARATUS FOR APPLYING LABELS TO BLOW MOLDED ARTICLES

Ronald S. Kaminski, Bowling Green, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Division of Ser. No. 64,643, Jun. 22, 1987, Pat. No. 4,853,169.
This application Apr. 4, 1989, Ser. No. 332,928
Int. Cl.[4] B29C *49/24, 49/36, 49/42*
U.S. Cl. 425—116 **2 Claims**



1. An apparatus for making hollow plastic articles wherein a label is positioned in each of a plurality of spaced partible molds in a predetermined array, preforms are positioned in each set of partible molds and the molds are closed and the preforms are blown outwardly to the confines of the molds to apply the label to the resultant hollow plastic article, said apparatus including means for delivering the labels to the molds comprising:

means for providing labels in a web of a roll of labels;

an endless vacuum conveyor;

a die cutting station;

means for moving the web of the roll of labels past said die cutting station;

a die cutting mechanism for successively die cutting the labels from the web of the roll of labels at said die cutting station;

means for moving said die cutting mechanism at a right angle to said web to cut said labels and means for continuing said movement of said die cutting mechanism to simultaneously directly deliver said labels to said endless vacuum conveyor; means for indexing a remaining portion of the web which has a label die cut therefrom past the die cutting station after the label has been die cut and delivered directly to said endless vacuum conveyor;

means for indexing said endless vacuum conveyor after each successive die cut to provide an array of labels on said

conveyor which corresponds in spacing to the spacing of the array of molds;

means for engaging the array of labels on said conveyor and removing them from said conveyor; and,

means for depositing the array of labels in one section of the array of molds.

4,880,370

EXTRUSION DIE FOR MULTILAYER FOILS OR PLATES OF THERMOPLASTIC SYNTHETIC RESIN

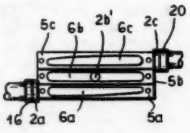
Klemens Krumm, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Reifenhauser GHBH & Co., Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,282

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734883

Int. Cl.[4] B29C *47/06*

U.S. Cl. 425—133.5 **10 Claims**



1. An extrusion die for the extrusion of a multilayer extrusion of thermoplastic synthetic resin, comprising:

a plurality of die plates in stacked relationship, each of said die plates being formed with an inlet at one edge of the respective die plate, an elongated outlet along another edge of the die plate, and a flow-spreading channel communicating between said inlet and said outlet and widening in the direction of said outlet, said outlets of said die plates all lying along a common side of a stack formed by the plates;

means forming an elongated extrusion orifice for issuing a relatively wide and thin extrusion connected to said common side of said stack and receiving thermoplastic synthetic resin from said outlets whereby the thermoplastic synthetic resin from said outlets forms layers in said extrusion; and

respective means at each of said inlets for connecting a respective extruder to the respective die plate for feeding a respective thermoplastic therethrough to the respective outlet, said stack including two die plates having fittings disposed symmetrically to opposite sides of a median plane through said stack perpendicular to said extrusion and said channels of said two die plates defined by walls extending mirror symmetrically and parabolically from the respective inlet to the respective outlet.

4,880,371

APPARATUS OF MACHINING DOUGHY MATERIAL

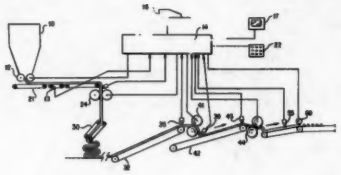
Louis A. Spinelli, Patterson, and Jeffrey M. Jenniges, Pompton Lakes, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 948,380, Dec. 31, 1986, which is a continuation-in-part of Ser. No. 839,448, Mar. 10, 1986, abandoned, which is a continuation of Ser. No. 670,833, Nov. 13, 1984, abandoned. This application Mar. 10, 1989, Ser. No. 321,987

Int. Cl.[4] B29C *47/92*; A21C *3/02*

U.S. Cl. 425—135 **5 Claims**

1. In an apparatus for machining dough including a device for extruding a sheet of dough, at least one pair of opposed powered rollers arranged to receive and size the sheet of dough and an apparatus arranged downstream of the at least one pair of opposed powered rollers for separating the sheet of dough into products for baking, the improvement which comprises: a system controller including a plurality of sensing device coupled to preselected areas of the apparatus for machining dough to sense dough characteristics at each of the preselected areas and a plurality of control signal outputs, each of the outputs being coupled to a respective one of the device for extruding dough, the at least one pair of opposed powered rollers and the apparatus for separating the sheet of dough, and



the controller further including a calculator operating to calculate control signals for selective output on the plurality of control signal outputs; the control signals all being calculated by the calculator as an integrated function of all of the sensed dough characteristics sensed by the plurality of sensing devices to provide an integrated control of the apparatus for machining dough for a constant mass dough flow throughout the apparatus.

4,880,372

MATERIAL AUTOMATIC FEEDING SYSTEM FOR INJECTION MOLDING MACHINES

Yutaka Keida, Tokyo, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

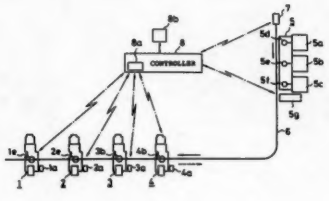
PCT No. PCT/JP87/00465, § 371 Date Mar. 4, 1988, § 102(e) Date Mar. 4, 1988, PCT Pub. No. WO88/00118, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 3, 1987, Ser. No. 183,750

Claims priority, application Japan, Jul. 4, 1986, 61-156303

Int. Cl.[4] B29C *45/17*

U.S. Cl. 425—145 **14 Claims**



1. An injection molding system comprising:

a plurality of injection molding machines;

a resin storage unit for storing resin which is to be injected into said injection molding machines;

a container that is selectively and mechanically detachable from said resin storage unit for containing said resin fed from said resin storage unit, said container being positioned adjacent to said resin storage unit when the container is located at a rest zone in which the container is at rest;

a transportation track extending between said rest zone and said plurality of injection molding machines;

a carrier associated with said transportation track for holding said container and for conveying said container along said transportation track between said rest zone and said plurality of injection molding machines; and

control means electrically coupled to said container and said

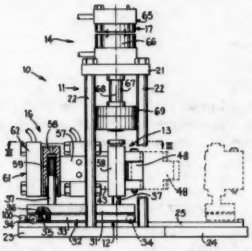
carrier for controlling said container and said carrier to selectively detach said container from said resin storage unit and to convey said carrier along said transportation track with said container held by said carrier.

4,880,373

TABLET PRESS

Stephen Balog, Kalamazoo, and Everett N. Hiestand, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 28, 1988, Ser. No. 187,569
Int. Cl.[4] B29B *11/12*
U.S. Cl. 425—149 **16 Claims**



1. In a press for forming a blocklike compact from powder, said press including a removable die which is vertically split into two halves which define therebetween a die opening which extends vertically through the die, removable upper and lower punches projecting into opposite ends of the die opening for defining a die cavity therebetween for creating the compact, a first fluid pressure cylinder means coacting with the die for applying a substantially horizontally directed force thereto tending to maintain the opposed die halves in closed engagement with one another, and a second fluid pressure cylinder means for applying a vertically directed compression force against one of said punches to effect compaction of the powder within the die cavity to create the blocklike compact, the improvement comprising:

a frame;

carriage means movably supported on said frame for horizontal displacement between first and second positions which are significantly horizontally displaced from one another;

die carrier means mounted on said carriage means and movable therewith between said first and second positions, said die carrier means including opposed side supports for confining the die therebetween, and a rear support for abutting contact with one side of said die, said die carrier means also including a front support which is movable relative to said side supports between open and closed positions for providing access to the region defined between said side supports, said front support when in the closed position cooperating with a front side of the die for confining the die between the front and rear supports and between the opposed side supports;

said first cylinder means having a housing which is stationarily fixed relative to said side supports and having a linearly extendable piston rod which projects substantially horizontally between said side supports for abutting contact with a rear side of said die;

said second cylinder means having a housing which is fixed relative to said frame and a piston rod which is linearly movable along a generally vertical axis which is fixed relative to said frame for applying a vertical compression force against said one punch;

said die when mounted on said die carrier means being disposed with the die opening substantially vertically aligned with the vertical axis of said second cylinder means when the carrier means is in said first position, said die being horizontally displaced from said vertical axis when said carriage means is in said second position;

said carriage means including a carriage member which removably mounts said other punch thereon, and spring-urged rollers carried by said carriage member for rolling engagement with said frame to permit movement between said first and second positions, whereby application of force by said second cylinder means to the compact formed by said die is transmitted vertically from said carriage means directly to said frame due to retraction of the rollers relative to the carriage member so that a part of the carriage member directly vertically abuts a part of the frame to permit direct vertical force transfer therebetween; and

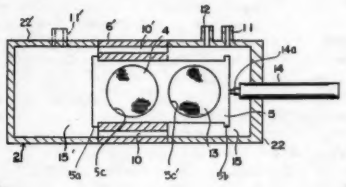
resilient support means connected between said carriage means and said die carrier means for permitting vertical floating movement of said die carrier means and said first cylinder means relative to said carriage means.

4,880,374

FILTER EXCHANGE DEVICE FOR AN EXTRUSION MOLDING MACHINE

Ken Hamamura; Sei Kawahara, and Mitsuhiro Goto, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1988, Ser. No. 196,406
Claims priority, application Japan, May 20, 1987, 62-121353
Int. Cl.[4] B29F *3/06*
U.S. Cl. 425—185 **16 Claims**



1. A filter exchange device of an extrusion molding machine for exchanging a first filter provided in an extrusion passage for molten resin, comprising:

a spare filter;

a first filter casing airtightly enclosing said spare filter in a region outside said resin passage and having first port means for exhausting air out of the filter casing and filling the interior of the filter casing with a gas inert to the molten resin.

4,880,375

APPARATUS FOR STRETCHING A PLASTIC RAW MATERIAL

Torahiko Hayashi, Tochigi, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Continuation-in-part of Ser. No. 928,633, Nov. 5, 1986, abandoned, which is a continuation of Ser. No. 752,992, Jul. 8, 1985, abandoned. This application Jul. 1, 1988, Ser. No. 214,882
Claims priority, application Japan, Jul. 7, 1984, 59-141084
Int. Cl.[4] A21C *3/02*
U.S. Cl. 425—335 **3 Claims**

1. An apparatus for stretching a plastic raw material, comprising:

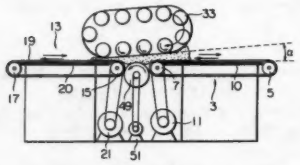
at least two conveyors arranged in series having respective conveying portions thereof forming a conveying path for plastic raw material fed onto said conveyors;

driving means for driving each of said conveyors at selected speeds and in forward and reverse directions, said driving

means driving said conveyors in the same direction for each of said forward and reverse directions and such that a conveyor downstream is driven at a faster speed than a conveyor upstream in each of the respective directions, in order to provide a stretching action to the plastic raw material on said conveying path;

a roller mechanism positioned above and extending over said at least two conveyors comprising a plurality of rollers which are freely axially rotatable and movable along an endless roller path, wherein the peripheries of said rollers on said endless roller path form a closed loop having a straight lower portion which is spaced at an adjustable spacing above said conveying path of said conveyors;

reversing means for alternately reversing said driving means for driving said conveyors first in the forward direction, with the downstream conveyor driven at a faster speed than the upstream conveyor, such that plastic raw material on said conveying path is passed in the forward direction in stretching contact with said straight lower portion of said rollers on said endless roller path, and then for driving said conveyors in the reverse direction, with the downstream conveyor in the reverse direction driven faster than the upstream conveyor, to pass the plastic raw material in stretching contact with said rollers in said reverse direction; and



adjusting means for adjusting the spacing of said straight lower portion of said rollers above said conveying path with each successive pass of the plastic raw material in the forward and reverse directions; and

wherein said adjusting means further includes means for adjusting an angle of inclination of said straight lower portion of said rollers relative to said conveying path in each direction as the raw plastic material is fed on said conveying path in successive passes.

4,880,376

METHOD AND APPARATUS FOR MONITORING AND CALIBRATING DAMPER POSITION

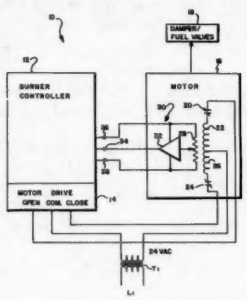
James I. Bartels, Hudson, Wis.; Paul B. Patton, Rockford, Minn.; Kenneth B. Kidder, Coon Rapids, Minn., and Alfred J. Gaskell, Hopkins, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 27, 1989, Ser. No. 303,360
Int. Cl.[4] F23N *3/00*
U.S. Cl. 431—12 **30 Claims**

1. A method for monitoring damper position of damper means which control flow of combustion air or fuel in a heating system where the damper means is movable between first and second end positions in response to movement of a motor shaft where the motor shaft moves in response to a movement request signal, the method comprising:

receiving a shaft position signal provided by continuous position detector means and having a value representative of position of the motor shaft;

stopping the motor shaft when the damper means reaches an end position; and



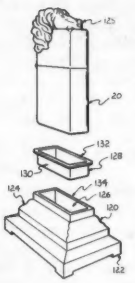
determining whether the value of the shaft position signal is within a predetermined tolerance when the damper means reaches the first and second end positions.

4,880,377

CIGARETTE LIGHTER WITH CHARM MOUNTED THEREON

William Ficho, Lincolnwood, Ill., assignor to Vasilia, Ltd., Chicago, Ill.

Continuation of Ser. No. 472,647, Mar. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 373,881, May 3, 1982, abandoned. This application Nov. 1, 1984, Ser. No. 666,145
Int. Cl.[4] F23Q *2/32*
U.S. Cl. 431—126 **4 Claims**



1. A personal accessory to be carried about on the person of the user, said accessory comprising a plain and unadorned generally rectangular box, said box being divided into a bottom section and a flip top section, said flip top section having two stable positions, said flip top being hinged to one side of said box, the upper surface of said flip top being a simple and unadorned panel having edges defining a predetermined perimeter; a cigarette lighter including at least a flint wheel and a wick completely enclosed within the box when the flip top is in a first of said two positions with said box closed, the lighter and box being shaped and proportioned so that a user normally holds the bottom section of the box in his fist with his fingers curled around it with the flip top of the lighter extending above the fist, the second of said two positions being an open position, the flip top being completely visible above the fist in both said opened and closed positions with the flint wheel accessible to the thumb on said fist while holding said box, sculptured charm means mounted on the outside of said unadorned top panel of said box to stand above said fist and be visible when said top is in either of said two stable positions closed over said bottom or

flipped to an open position, said charm being approximately aligned with and in front of the flame of said lighter insofar as the onlooker is concerned when the lighter is in use; an underside of said charm forming a somewhat cup shaped concave pocket having an unbroken surface which is closed on one side, said closed side of said pocket being fitted to follow, surround, and rest on said top panel, and to drape down and around at least part of the perimeter defined by one end and the adjacent edges of the upper surface of said flip top; said closed side of said pocket nesting against the one end of the top panel and extending over a side of the flip top of said lighter box downwardly far enough on at least one side of said lighter to give a vertical mechanical stability for attaching the charm to the flip top without interfering with the movement of the flip top between the two positions, and means for integrally attaching the closed side of said pocket on said charm to said top panel and to said one end at least one side of said flip top at a location where said pocket nests on and hugs said top.

4,880,378

COMBUSTION PLANT WITH A DEVICE FOR REDUCING NITROGEN OXIDES IN FLUE GASES

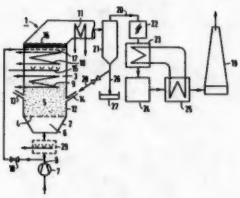
Erich Hums, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,748

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633285

Int. Cl.[4] F23D *19/00*

U.S. Cl. 431—170 **16 Claims**



1. A combustion plant having a device for reducing nitrogen oxides in flue gases, comprising a combustion chamber, an injection device disposed in said combustion chamber for injecting a gaseous reducing agent in the form of at least one of the gases ammonia, carbon monoxide and hydrogen, and a catalyst arrangement disposed downstream of the injection device in flow direction of the flue gases, and being formed with a catalyst in said combustion chamber being heated to at most 1,300° C. and being formed of a metal alloy containing elements of the iron group subjectible to a flue gas temperature in excess of 600° C.

4,880,379

METHOD FOR TRANSFORMING A ROTARY KILN INTENDED IN PARTICULAR FOR THE MANUFACTURE OF CEMENT, KILN OBTAINED BY THIS METHOD AND BURNING LINE EQUIPPED WITH THIS KILN

Michel Champonnois, Houilles, France, assignor to CLE, Courbevoie, France

Filed Sep. 27, 1988, Ser. No. 249,952

Claims priority, application France, Sep. 30, 1987, 87 13529

Int. Cl.[4] F27D *1/16, 15/02;* F27B *15/00*

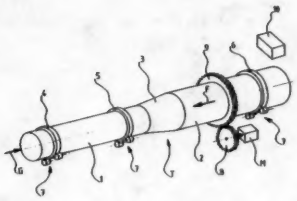
U.S. Cl. 432—3 **1 Claim**

1. A method for transforming a rotary kiln intended for said manufacture of any material such as cement and including a rotatable tube, rolling bearings, carrying a load, for supporting said tube at its central part and at its ends and a planetary cooler provided at one of said ends of said tube, this method comprising the steps of:

suppressing said cooler at said one end of said tube, and said tube portion which is associated therewith, to markedly increase said load carried by said bearing located at said central part of said tube;

cutting said tube substantially at said central part thereof to provide two tube portions having the same diameter;

replacing one of said tube portions by at least one tube section having a smaller diameter than that of said other tube portion which is retained;



connecting said tube section of smaller diameter to said other tube portion of larger diameter through a conical member and mounting said bearing at the central part of the tube onto said tube section, whereby said load carried by said bearing is reduced to a value which is lower than said increased load and substantially identical to the initial value of said load carried by the bearing at said central part of said initial kiln tube equipped with said cooler and used for carrying out said transformation.

4,880,380

ORTHODONTURE APPLIANCE WHICH MAY BE MANUALLY INSTALLED AND REMOVED BY THE PATIENT

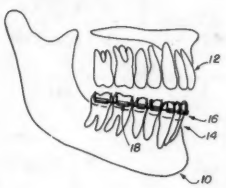
Martin G. Martz, Park Central Office Building, Suite 301, 215 South Monarch St., Aspen, Colo. 81611

Filed Oct. 13, 1987, Ser. No. 108,427

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—11 **44 Claims**



1. An appliance for orthodonture characterized in that at least most of said appliance may be installed and removed by the patient as required, said appliance comprising:

(a) a plurality of individual clasps for respectively gripping onto individual upper or lower teeth of the patient, each of said clasps being configured such that they can be individually manually placed in gripping positions onto and manually disengaged from said teeth by the patient wherein, each of said clasps including at least one generally U-shaped spring tempered element movable between a biased contracted state and a manually forced expanded state whereby to clamp to an associated tooth;

(b) first and second continuous lengths of wire; and

(c) means for disengageably connecting each of said wires at predetermined points along its length to each of said clasps such that when the clasps are in gripping positions on their respective teeth, said wires extend from tooth to tooth along the facial and/or lingual sides of the teeth, respectively, and exert forces on the teeth to move the latter from malocclusion positions to desired, more ideal positions.

4,880,381

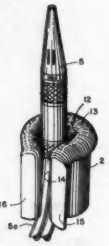
BARRIERS FOR DENTAL AND MEDICAL HANDPIECE HANGERS

Dick H. Nieusma, Jr., 13658 Hanford Ct., Warren, Mich. 48093

Filed Jul. 14, 1988, Ser. No. 218,973

Int. Cl.[4] A61C *1/02*

U.S. Cl. 433—28 **19 Claims**



1. A device for covering a dental or medical handpiece hanger for the purpose of preventing the contamination of such hanger such hanger having an opening to receive said instrument and inner and outer surfaces normally contacted by and for supporting said instrument comprising a shell constructed of a thin, deformable material molded to a shape to be received in the said opening of said hanger and to cover said inner support surfaces and at least portions of said outer surface, said deformable material having substantially no memory whereby when said shell is inserted in said hanger, it can be deformed and adapted to the said inner and outer surfaces so as to stay in place during removal and replacement of a handpiece.

4,880,382

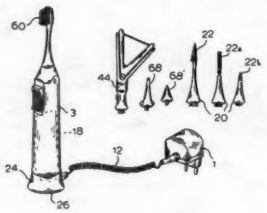
INTEGRATED ORAL HYGIENE SYSTEM

Michel A. Moret, Geneve, and Pierre J. Jousson, Montchoisy, both of Switzerland, assignors to Les Produits Associes, LPA SA, Switzerland

Filed Dec. 3, 1986, Ser. No. 937,566

Int. Cl.[4] A61C *3/03*

U.S. Cl. 433—118 **3 Claims**



1. An integrated oral hygiene system for facilitating a complete oral hygiene program comprising in combination:

a handle having a top end and a bottom end, a motor housed in said handle, and having a shaft having a longitudinal axis protruding therefrom, said shaft having a longitudinal axis and being rotationally oscillated about said longitudinal axis responsive to said motor;

a plurality of accessories interchangeably mountable on said shaft and adapted to be used interchangeably and frequently;

said accessories comprising:

a toothbrush having bristles and a holder adapted to fit on the shaft;

a dental floss holder having one end adapted to fit on said shaft and another end divided into a pair of forks;

said forks having extremities bent along different axes having floss stretched therebetween;

an interproximal brush, rotationally symmetric about said longitudinal axis, having a holder removably mounted on said shaft; and

a gum stimulator, rotationally symmetric about said longitudinal axis, mountable upon said shaft.

4,880,383

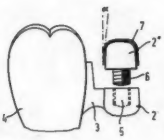
MAGNETIC FASTENING SYSTEM FOR DENTAL PROSTHESIS

René Weber, Schmitten, Switzerland, assignor to I.D.R. B.V., Boerhaaveplein, Netherlands

Filed Nov. 20, 1987, Ser. No. 123,606

Int. Cl.[4] A61C *13/235*

U.S. Cl. 433—189 **11 Claims**



1. A dental prosthesis system for use in a mouth of a patient comprising:

a support element retained in the patient's mouth, said support element comprising a top portion and a bottom portion, said top portion and said bottom portion each having a substantially curved surface, said top portion comprised at least in part of a magnetic material;

means for attaching said support element to a side face of at least one dental element already present in the patient's mouth; said attaching means being connected to said bottom portion and comprising a support arm on at least one side of said bottom portion;

a fastening element secured to a prosthesis, said fastening element comprising a cover plate of magnetically receptive material having a shape suitable for partially embracing the top portion of said support element; and

wherein said support element is detachably connected to said fastening element by magnetic forces when the top portion is encased in said fastening element.

4,880,384

BRAILLE TEACHING APPARATUS

Kevin C. Murphy, 97 Forrest St., Plaistow, N.H. 03865-1810

Filed Feb. 3, 1989, Ser. No. 305,774

Int. Cl.[4] G09B *21/00*

U.S. Cl. 434—113 **7 Claims**

1. A Braille teaching apparatus comprising:

a plurality of Braille blocks containing from one to six raised dots in a pattern indicative of a Braille alphanumeric character,

a rigid board means,

said rigid board means having a top edge and a bottom edge,

wherein said Braille blocks being placed in a specific alignment with respect to said top edge of said rigid board means allowing for comprehension of the symbolic meaning of said Braille blocks so placed,

wherein said Braille blocks being placed on said rigid board means in close proximity to one another forming phonetic and mathematical sentences,

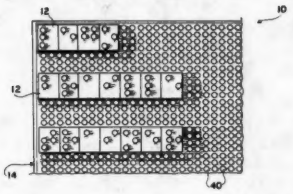
wherein said Braille blocks comprise a body having the shape of a rectangular parallelopiped,

said body comprising four sides, and a top,

said top having a bottom surface and a top surface,

said sides and said top attaching to one another such that each of said sides being perpendicular to the next and perpendicular to said top,

said bottom surface of said top having at least one cylindrical member extending therefrom to the bottom edge of said



Braille block allowing for attachment of said Braille block to said rigid board means,

said top surface of said top of said Braille blocks having said raised dots disposed thereon,

said rigid board means having a top surface and a bottom surface,

said top surface of said rigid board means being covered by a plurality of protrusions in a regular rectilinear pattern allowing for fixed acceptance of said Braille blocks thereupon with said cylindrical members tightly disposed between said protrusions,

said rigid board means holding said Braille blocks preventing inadvertent removal by any sudden action of an individual, and

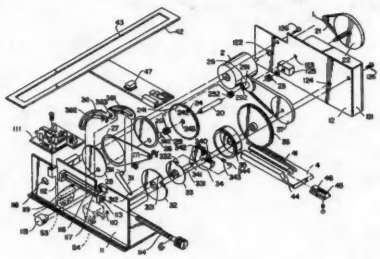
the combination of said Braille blocks and said rigid board means being usable as an instructor of individuals having disabilities in addition to blindness.

4,880,385

FULLY AUTOMATIC SPEED-READING TRAINER

Yi-Chao Huang, 16, Chia-Shui 1st Tsun, Chia Yi, Taiwan

Filed Dec. 11, 1987, Ser. No. 131,736
Int. Cl.[4] G09B *17/02, 17/04*
U.S. Cl. 434—181 **35 Claims**



1. A fully automatic speed-reading trainer which comprises:

(a) a housing having at least two opposed frames, a first left-hand frame, and a second, right-hand frame;

(b) a control circuit assembly mounted on said first frame;

(c) a plurality of magnetic switches mounted on said first frame;

(d) a battery compartment positioned within said second frame; and

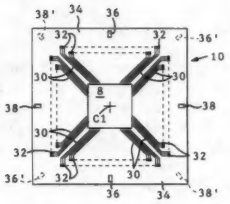
(e) a driving assembly, an advancement assembly, and an advancement adjustment assembly, wherein said driving assembly comprises means for rotating said advancement assembly to drive a viewing window attached to the housing in a generally linear fashion, said driving assembly further comprising an electric motor, a first, driving gear rotatably driven by said electric motor and a second, larger gear mounted on a first axle and adapted to be driven by said driving gear, wherein an eccentric cam and a first pulley are attached to said axle on opposite sides of said larger gear, each of said eccentric cam and said pulley comprising an axle tube adapted to fit over respective ends of said axle, said trainer further comprising first and second coiled springs mounted over respective ones of said axle tubes, each of said coiled springs having a free end adapted to be inserted into respective holes located on a flat surface of said larger gear, wherein when said larger gear is rotatably driven in either a clockwise or a counterclockwise direction, one of said eccentric cam and pulley will be rotatably driven by the tightening action of one of said springs.

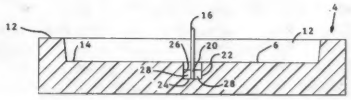
4,880,386

SOCKETING A SEMICONDUCTOR DEVICE

Dimitry G. Grabbe, Middletown, and Iosif Korsunsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 18, 1988, Ser. No. 273,398
Int. Cl.[4] H01R *9/09, 23/72*
U.S. Cl. 439—68 **18 Claims**





1. An electrical connector assembly comprising in combination;

a semiconductor device bonded to leads attached to a segment of film having a peripheral margin and a center point within the margin, the leads being electrically connected to contact pads distributed about said center point, said margin having formed therein a plurality of pairs of slots, each of which is elongate in the direction of said center point, the slots of each pair being located on substantially diametrically opposite sides of said center point;

a protective insulating carrier providing a first seat for said film segment and from which upstands a plurality of posts each engaged in a respective one of said elongate slots

each with substantial clearance in the longitudinal direction thereof but closely fitting the slot in the transverse direction thereof; and

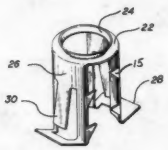
an insulating socket mated with said carrier and providing a second seat for said film segment, there being formed in said second seat, a plurllity of pockets each snugly receiving a respective one of said posts, a plurality of electrical contact elements provided on said second seat, each engaging a respective one of said contact pads on said film, for connecting the semiconductor device to an external circuit.

4,880,387

CONNECTOR FOR FLEXIBLE ELECTRICAL CONDUIT

Allan Stikeleather, Canton, and Geoffrey Blake, Boston, both of Mass., assignors to IBC Corporation, South Easton, Mass.

Filed Oct. 3, 1988, Ser. No. 251,798
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—98 **2 Claims**



1. A one-piece, flexible conduit connector for connecting an electrical conduit having a helically grooved outer metal sheath and electrical wires within said sheath, to an electrical junction box having an opening formed in a wall thereof, said connector including:

a circular face portion having a round opening formed therethrough;

an anti-short flange surrounding said opening and projecting a predetermined distance outward from a front surface of said face portion and tapered away from said opening, said front side of said face portion facing into said junction box;

a pair of flexible arms depending from and flaring away from a rear surface of said face portion, said arms being opposite to each other around the circumference of said face portion and arcuately shaped to conform to said conduit;

a plurality of barbs formed on said flexible arms and positioned to engage said helical groove over a plurality of turns of said groove when said electrical conduit is screwed into said connector, said barbs having pointed ends engaging the surface of said grooves so as to place said metal sheath and junction box in good electrical contact with each other and to prevent said conduit from being either pulled from or backthreaded out of said connector;

a flange extending outwardly from an end of each flexible arm at angle to said flexible arm so as to abut against the outer surface of said junction box wall and limit the insertion of said connector in said junction box wall opening; and

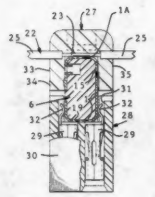
a retaining member normally projecting out from each flexible arm, each retaining member being deflectable inwardly to allow said connector to be inserted into said junction box wall opening and springing outwardly to its normal position once said connector has been inserted in said junction box wall, thereby clamping said connector and conduit in place.

4,880,388

ELECTRICAL CONNECTOR ASSEMBLY WITH LEAD FRAME

Robert E. Beamenderfer, Palmyra; William B. Long, Camp Hill, and John R. Shuey, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 12, 1988, Ser. No. 217,745
Int. Cl.[4] H01R *9/07*
U.S. Cl. 439—108 **16 Claims**



1. In an electrical connector for connection to corresponding signal wires and corresponding ground wires of at least one electrical cable, the connector comprising: an insulative housing block, conductive signal contacts mounted to the housing block and having corresponding wire connecting portions adapted for connection to the corresponding signal wires, and a conductive ground bus having wire connecting portions adapted for connection to the corresponding ground wires, the improvement comprising:

the signal contacts and the ground bus are joined together and are mounted on the housing block prior to selected ones of the signal contacts being detached from the ground bus,

means for detaching the signal contacts individually from the ground bus while the signal contacts and the ground bus remain mounted to the housing block, whereby the selected ones of the signal contacts are constructed for being detached from the ground bus, and at least one of the signal contacts remains joined to the ground bus, and

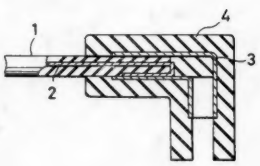
the ground wires of said at least one electrical cable are connected to the wire connecting portions of the ground bus, and the signal wires of said at least one electrical cable are connected to the wire connecting portions of the signal contacts.

4,880,389

IGNITION PLUG CONNECTOR AND MANUFACTURING METHOD

Shigehiko Mochizuki, Susono; Masahiro Kanda, and Yoshinori Serizawa, both of Gotenba, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Aug. 22, 1984, Ser. No. 643,236
Claims priority, application Japan, Aug. 23, 1983, 58-152419
Int. Cl.[4] H01R *13/573*
U.S. Cl. 439—125 **6 Claims**



1. An ignition plug connector comprising a metallic terminal

having at one end thereof a plug receiving section for insertion of an ignition plug, at the other end thereof a cord connecting section for receiving one end portion of a high tension cord and crimped after the end portion is inserted, and, having a cut-out in the center section between said plug receiving portion and said high tension cord connecting section, a thin covering layer of silicone resin primer covering at least said end portion of said high tension cord; and a rubber cap which is formed through molding an addition reaction type silicone rubber having a viscosity from 10 to 50,000 poise to generally cover said metallic terminal and said end portion of said high tension cord; wherein said plug receiving section of said metallic terminal and said rubber cap portion axially adjacent to said plug receiving section form a hole for the ignition plug; the exposed conducting member extending from said end portion of said high tension cord contacts the inner surface of said metallic terminal; and a wall section is integrally formed with said rubber cap through said cut-out between said plug receiving section and said cord connecting portion to completely contact said exposed conducting member of the end portion of said cord and thereby eliminate air gaps in the vicinity of said exposed conducting member.

4,880,390

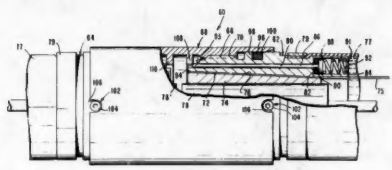
PRESSURE COMPENSATED INTERMODULE TOWED ARRAY CONNECTOR

Walter H. Brackmann, Jr., Apple Valley; Cornelius A. Van Gelder, Fullerton, and Roman A. Halushka, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 83,910, Aug. 6, 1987, abandoned, which is a continuation of Ser. No. 682,571, Dec. 14, 1984, abandoned, which is a continuation of Ser. No. 30,810, Apr. 17, 1979, abandoned. This application Oct. 25, 1988, Ser. No. 262,456

Int. Cl.[4] H01R *13/523*

U.S. Cl. 439—204 **20 Claims**



1. A pressure compensated underwater intermodule coupling mechanism comprising:

a pair of connectors adapted to be coupled at their mating faces;

insulative fluid filled hoses and electromagnetic signal carrying conductors therein respectively coupled to and terminated by said connectors, and subject to being sgueezed by underwater pressure exerted on said hoses;

a fluid path incorporating a normally closed valve in at least one of said connectors and extending between its fluid filled hose and its connector mating face and including a movable element, sealing means and at least one groove;

an outer shell enclosing said movable element with said sealing means carried by one of said shell and said movable element and sandwiched therebetween, and said one groove being in the other of said shell and said movable element adjacent said sealing means;

a valve-opening member at said mating face of said other connector contactable with said movable element of said valve when said connectors are joined, to cause said sealing means to be positioned at said groove and to permit the underwater pressure to sgueeze said hoses to force the fluid to flow through said groove and around said sealing means from at least one of said hoses to said mating faces to egualize the underwater pressure exerted on and in the joint between said connectors.

4,880,391

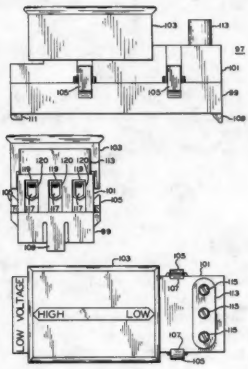
APPARATUS FOR CONNECTING MULTIPLE WINDINGS

Jerome P. Hurtgen, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 30, 1988, Ser. No. 213,720

Int. Cl.[4] H01R *29/00*

U.S. Cl. 439—221 **6 Claims**



1. A dynamoelectric machine adapted for energization from a power source comprising:

a housing including a stationary assembly having a plurality of winding means for excitation upon the energization of the dynamoelectric machine and disposed in a predetermined relationship with each other, each winding means having a plurality of lead wires connectable to each other and to the power source in at least two different configurations;

a terminal box assembly mounted to said housing exteriorly thereof and having a mounting table disposed within the terminal box assembly;

a plurality of termination means for connection to said lead wires respectively;

a terminal block having a plurality of predeterminately oriented aperture means for respectively receiving said termination means;

a plug device for coupling with said terminal block in at least two different orientations to effect interconnection of the winding means in the at least two different configurations;

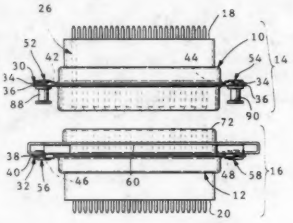
a base member releasably connected to said terminal block and seated in engagement on said mounting table within said terminal box assembly, said base member for releasably maintaining said base member against displacement from the seating engagement thereof with said mounting table; and

means associated with said terminal block for connecting at least some of the said termination means to the power source thereby to effect energization of the dynamoelectric machine and the excitation of said winding means in a preselected one of the two different configurations.

4,880,392
SLIDELATCH SECURING POST

Stephen B. Schieferly, B-11 326 Lopax Rd., Harrisburg, Pa. 17112

Continuation of Ser. No. 134,673, Dec. 18, 1987, abandoned.
This application Feb. 24, 1989, Ser. No. 315,178
Int. Cl.[4] H01R *4/50*
U.S. Cl. 439—347 6 Claims



1. An electrical connector assembly comprising:

a dielectric housing having contact receiving passages therein, said contact receiving passages having contacts secured therein;

flange means extending from said housing, said flange means having a pair of spaced apertures therein;

a latching member proximate the flange means, said latching member having an aperture to receive said housing and a pair of slots, at least coextensive with the spaced apertures in said flange means;

a securing post received in at least one of said coextensive apertures and slots, said securing post having

a first shoulder spaced from and facing said flange means, said first shoulder engaging the latching member proximate said slots;

a second shoulder facing said flange means, said second shoulder engaging said flange means so as to position said first shoulder a predetermined distance from said flange means; and

shank means having a free end extending into said at least one coextensive aperture and slot, the free end of said shank means rolled to secure said securing post to said flange means between said second shoulder and the rolled free end while slidingly securing said latching member to said housing between said first shoulder and said flange, whereby the latching member is slidingly secured to the electrical connector assembly.

4,880,393
CONNECTOR WITH LOCKING MECHANISM

Eirou Moji, Mitaka, Japan, assignor to Moji & Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 262,009
Claims priority, application Japan, Aug. 5, 1988, 63-195838
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—352 1 Claim

1. A connector with a locking mechanism comprising:

a plug body made of an insulator and holding contacts;

a cylindrical member secured to an outer periphery of said plug body;

a slidable cover provided for forward and rearward movement on an outer periphery of said cylindrical member;

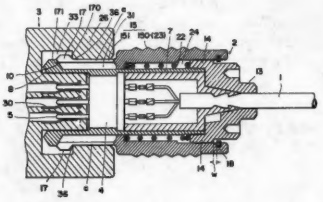
a locking member provided for forward and rearward movement between said slidable cover and said cylindrical member;

a spring provided between said locking member and said cylindrical member for forwardly biasing said locking member;

said locking member being provided with an interlocking portion interlocked to said slidable cover such that it is moved rearwardly against the spring force of said spring with a rearward movement of said slidable cover, said locking member having an end capable of being elastically displaced in the radial direction of said plug body, said end of said locking member being provided with a locking portion having a rear engagement surface and a front contact surface;

an inclined member located at a position forwardly of and near said contact surface of said locking portion and fixed in a position with respect to said plug body; and

a socket having a contacts electrically connected to said contacts of said plug body, said socket being provided with an annular groove, into which a front portion of said cylindrical member, said inclined member and said locking portion are capable of advancing while being elastically deformed, the outer or inner periphery of said annular groove being provided with a locking recess, into



which said engagement surface of said locking portion is advanced;

said plug body being provided on an outer periphery thereof with a first engagement portion;

said slidable cover being provided adjacent to its rear end with a second engagement portion for engaging with the first engagement portion of said plug body to prevent forward detachment of said slidable cover;

said slidable cover and said locking member being provided with respective interlocking portions interlocked to each other with a rearward movement of said slidable cover, said

wherein said interlocking portions are arranged such that a fixed gap is formed between to two in a state in which the contact surface of said locking portion provided on the front end of said locking member engages with said inclined member provided on the side of said plug body.

4,880,394
HEATING PANEL ASSEMBLY

Cuthbert J. Kilbride, Fredricton, Canada, assignor to Canray Incorporated, Oromocto, Canada

Filed Dec. 22, 1988, Ser. No. 288,452
Claims priority, application Canada, Feb. 11, 1988, 558674
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—404 25 Claims

1. An electrical connector for an electrical heating panel comprising:

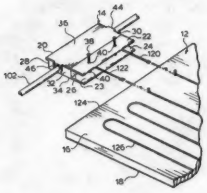
an electrically insulative housing,

panel engaging means extending outwardly from said housing,

entry and exit ports in said housing for passage of a multiple conductor power line therethrough,

retaining and piercing means in said housing to electrically isolate individual insulated conductors of the power line in a path between said entry and exit ports, and including electrically conductive piercing members adapted to pierce the insulation of the isolated conductors to effect electrical contact between respective piercing members

and respective conductors, said piercing members being electrically isolated from each other, and



inlet means in said housing for passage of leads from a heating panel for electrical connection with the piercing members.

4,880,395

CONTACT ON TEST SWITCH

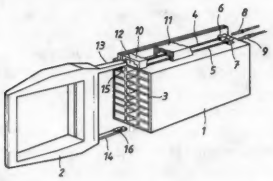
Rolf Eriksson; Gudmar Hammarlund, both of Västerås, and Lars-Erik Sundqvist, Örebro, all of Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Dec. 9, 1988, Ser. No. 282,273

Claims priority, application Sweden, Dec. 15, 1987, 8705000

Int. Cl.[4] H01R *31/08, 13/00, 25/00*

U.S. Cl. 439—507 **5 Claims**



1. A device for achieving a contact function in a protective relay test system, said system comprising a test switch with compartments for different contact units and a test-plug handle with contact pins for activating the function of the contact units and adapted for insertion into the test switch, wherein each of the upper and/or lower side of the test switch is provided with two uninsulated, parallel contact pins/slide bars extending from the front edge of the test switch to its rear edge and each being provided at its rear edge with connection parts for transition to a common conductor, the contact pins/slide bars and the connection parts being mounted in a guide structure having an inner guide profile adapted for guiding resilient tongues arranged on the test-plug handle, each of said tongues, on that side facing the contact pins, being provided with a contact washer, and wherein contact pins, guides, tongues and contact washers cooperate in such a way that, once the test-plug handle has been inserted into the test switch, contact is made between the two contact pins/slide bars on the upper and/or lower side(s) of the test switch.

4,880,396

COAXIAL CONNECTOR

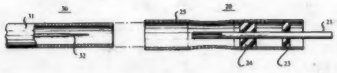
Dominic T. Lipari, Reynoldsburg, Ohio, assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 16, 1988, Ser. No. 207,674

Int. Cl.[4] H01R *17/04*

U.S. Cl. 439—578 **8 Claims**

1. A coaxial connector comprising a central connector element; and an essentially cylindrical spring member surrounding at least a portion of said central connector element, said member having an essentially circular opening at one end adapted to receive therein a coaxial plug having a signal and ground conductor such that the signal conductor makes electrical contact to the central connector element and the ground conductor makes electrical contact to the spring element, said member including a plurality of slots in a portion of its surface



removed from said opening, said slots extending in a direction essentially parallel to the axis of the member, the slotted portion providing a sufficient spring force to hold the ground conductor in place and maintain electrical contact thereto in the absence of any additional elements concentric with said spring member.

4,880,397

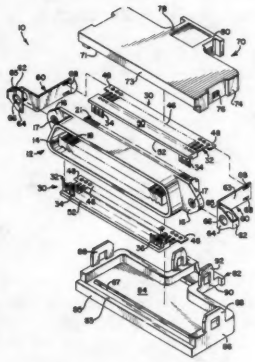
FILTERED CABLE HARNESS CONNECTOR ASSEMBLY

Andrew J. Dawson, Jr.; John C. Farrar, both of Harrisburg; Douglas J. Pirc, Mechanicsburg, and Atalee S. Taylor, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 29, 1988, Ser. No. 277,106

Int. Cl.[4] H01R *13/66*

U.S. Cl. 439—620 **15 Claims**



1. A filtered cable harness connector assembly, the assembly including a multiterminal connector having at least one row of terminals therein, at least one planar array of conductors terminated to respective ones of the terminals and extending rearwardly from the connector in a given lateral spacing, the assembly further comprising:

a filter subassembly associated with each said at least one array of conductors and each assembly having a plurality of contact members, a plurality of filter members, means housing said contact members and said filter members, and bus means;

said plurality of contact members having first and second contact portions, said first contact portions extending from a conductor proximate surface of said housing means and being appropriately spaced and adapted to become electrically connected with respective ones of said conductors of said at least one array;

said housing means including a plurality of filter receiving apertures along a selected face thereof, said second

contact portions being exposed along respective bottom surfaces of respective said apertures;

third contact portions paired with said second contact portions and spaced therefrom, said third contact portions being exposed along respective said aperture bottom surfaces;

said plurality of filter members disposed in respective said apertures and electrically joined to respective pairs of said second and third contact portions;

said bus means extending from and commoning said third contact portions and having at least one ground engageable portion exposed by said housing means;

each said filter subassembly being securable within said cable harness connector assembly along each said array of conductors rearwardly of said connector with said first contact portions electrically connectable with respective said conductors; and

means covering said connector, said at least one array of conductors and said at least one said filter assembly such that said at least one ground engageable bus portion is exposed to be engaged by grounding means.

4,880,398

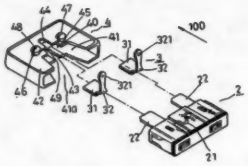
FUSE HOLDER FOR HOLDING A FLAT-TYPE FUSE BLOCK

Fu-Cheng Hsueh, No. 1045, Jen-Ai Tsun,, Jen-Te Hsiang, Tai-nan Hsien, Taiwan

Filed Aug. 17, 1988, Ser. No. 233,136

Int. Cl.[4] H01R *33/95*

U.S. Cl. 439—622 **5 Claims**



1. A fuse holder for holding a flat-type fuse block having a flat body which has two broader sides separated by a series of narrower sides, a pair of male terminals, vertically and outwardly protruding via one said narrower side of the flat body from the inside thereof, and a fuse disposed inside said flat body and connected between the pair of male terminals, comprising:

a housing adapted to receive said fuse block and said pair of male terminals therein, said housing being hollow and flat with two broader sides separated by a series of narrower sides, one said narrower side of said housing being open to enable said fuse block to be inserted thereinto, one said broader side of the housing having an elongated slot with two ends substantially parallel to the opened side of said housing and a notch communicating between said slot and said open side of said housing;

only one pair of female terminals disposed within said housing and adapted to mate with said pair of male terminals, each said female terminal having a clip portion for clamping one of said male terminals and a connector portion extending at an approximate right angle from said clip portion and passing through said slot of said housing, said connector portions having been inserted into said slot via said notch, said clip portion being positioned substantially parallel to the two broader sides of the housing.

4,880,399

SOCKET

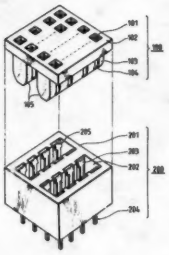
Yoshiaki Ichimura, Tokyo; Shinichi Ishizuka, Tachikawa; Mitsuo Komoto, and Shoji Umesato, both of Tokyo, all of Japan, assignors to Japan Aviation Electronics Industry, Limited and NEC Corporation, both of Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,098

Claims priority, application Japan, Feb. 3, 1988, 63-13388

Int. Cl.[4] H01R *13/352*

U.S. Cl. 439—689 **7 Claims**



1. A socket comprising:

(A) a cover including a flat insulating member having a plurality of arrays of holes made therethrough for insertion of pins of a member to be connected to the socket, at least one insulating protrusion protrusively provided on the underside of the flat insulating member, with its side wall surfaces lying along the arrays of pin insertion holes, and guide grooves cut in the side wall surfaces of the insulating protrusion for guiding the pins inserted through the pin insertion holes; and

(B) a socket body including an insulating housing having at least one recess made therein for receiving the insulating protrusion of the cover, a plurality of contact pieces held on side walls of the recess for making contact with the pins guided by the guide grooves, and terminals electrically conducting to the contact pieces and led out of the insulating housing on the side opposite from the cover,

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4,880,400

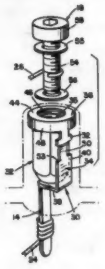
WIRE-WRAP CONNECTOR

Richard C. Baubles, Maplewood, N.J., assignor to Jacobson Mfg. Co., Inc., Kenilworth, N.J.

Filed Feb. 24, 1988, Ser. No. 159,930

Int. Cl.[4] H01R *4/34*

U.S. Cl. 439—722 **31 Claims**



1. A connector embedded in an electrically-insulating material for receiving a first conductor in a wrapped relationship

thereto and a second conductor and electrically connecting the conductors, comprising:

a first, electrically-conducting piece having a post extending from the insulating material configured to receive the first conductor wrapped thereto, and a contact portion having a contact face extending transversely to the post and a flange extending transversely to the contact face, the flange being embedded in the insulating material with the contact face of the contact portion being exposed at the surface of the insulating material, and

a second piece not unitary with the first piece including structure embedded in the electrically-insulating material and received in the flange of the first piece, and including connecting structure for connecting the second conductor to the connector and electrically connecting the second conductor to the contact face of the first piece, whereby an electrical path is established from the first conductor to the second conductor through the first, electrically-conducting piece.

4,880,401

ELECTRIC FEMALE CONNECTOR PIECE

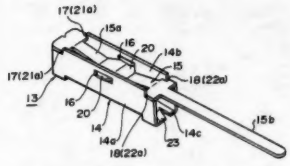
Koichi Shima, Takatsuki, and Motoyuki Tomizu, Yokobayashi, both of Japan, assignors to Omron Tateisi Electronics Company, Kyoto, Japan

Filed Sep. 27, 1988, Ser. No. 250,264

Claims priority, application Japan, Oct. 13, 1987, 62-156592[U]

Int. Cl.[4] H01R *13/187*

U.S. Cl. 439—746 **4 Claims**



1. An electric female connector piece for receiving a pin-shaped male connector piece therein for achieving an electric connection therewith, comprising:

a connector piece main body having a C-shaped cross section by being provided with a pair of mutually opposing, elongated strips which are joined together at their long sides by a connecting strip;

a contact piece consisting of an elongated strip which is adapted to be disposed between said mutually opposing strips defining a cavity of a substantially rectangular cross section;

a fitting hole provided in a middle part of each of said mutually opposing strips for receiving a fitting projection provided in each lateral long edge of said contact piece;

a first engagement portion provided in each of said mutually opposing strips at its lengthwise end for engagement with a corresponding part of said contact piece;

a second engagement portion provided in each of said mutually opposing strips at its other lengthwise end for engagement with another corresponding part of said contact piece; and

a spring tab bent from the said connecting strip for elastically urging said male connector piece against said contact piece.

4,880,402

METHOD AND APPARATUS FOR PREVENTING THE ATTACHMENT OF FOREIGN BODIES TO CONTROLLABLE PITCH PROPELLER LINKAGES OF WATERCRAFT

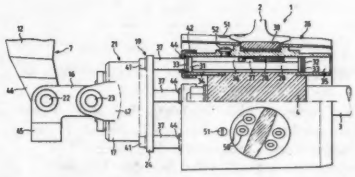
Peter Müller, Widmerstrasse 27, Zürich, Switzerland

Filed Aug. 18, 1987, Ser. No. 86,921

Claims priority, application Switzerland, Aug. 22, 1986, 3374/86

Int. Cl.[4] B63H *3/08*

U.S. Cl. 440—50 **5 Claims**



1. Apparatus for use in a watercraft having a rotatable propeller drive shaft connected to a driving engine and comprising:

a coupling slidably disposed along the shaft, the coupling including a rotatable first section secured to the shaft and a non-rotatable second section spaced from the shaft and having bearing means in which the first section is rotatably disposed;

a variable pitch propeller having a hub secured to the shaft, a plurality of bearing housings secured to the hub, and a like plurality of propeller blades, each blade having a base, each base being rotatably disposed in the corresponding bearing housing;

a like plurality of connecting rods, each connecting rod having two opposite ends and being slidably disposed in the corresponding bearing housing, each connecting rod having a position of protection at which it is disposed completely in the corresponding bearing housing wherein it cannot be attacked by foreign bodies;

a like plurality of first coupling means, each first coupling means being disposed in the corresponding bearing housing to couple one end of the corresponding rod to the base of the corresponding blade;

a like plurality of second coupling means provided on said connecting rods and each coupling another end of the corresponding connecting rod to the first section of the coupling whereby movement of the second section of said coupling back and forth along the shaft appropriately adjusts the pitch of the blades, said second section being positioned to place all connecting rods in the position of protection when the engine is in an inoperative or an operative position and being so positioned, when the engine is started, as to place all connecting rods in a position at which the blades are in neutral position.

5. In a method incorporating apparatus for use in a watercraft having a rotatable propeller drive shaft connected to a driving engine wherein a coupling is slidably disposed along the shaft, the coupling having a rotatable first section secured to the shaft and a non-rotatable second section spaced from the shaft with bearing means in which the first section is rotatably disposed, and a variable pitch propeller having a hub secured to the shaft and provided with a plurality of bearing housings secured to the hub, the propeller having a like plurality of propeller blades, each blade having a base, each base being rotatably disposed in the corresponding bearing housing and wherein each of like plurality of connecting rods has two opposite ends and is slidably disposed in the corresponding bearing housing, and wherein each of a like plurality of first coupling means is disposed in the corresponding bearing housing to couple one end of the corresponding rod to the base of

the corresponding blade and each of a like plurality of second coupling means couples another end of the corresponding connecting rod to the first section of the coupling whereby movement of the second section back and forth along the shaft appropriately adjusts the pitch of the blades, the method comprising the steps of:

(a) positioning the second section to place all connecting rods in fully concealed position within the corresponding bearing housings to prevent the connecting rods from attack from foreign bodies when the engine is in inoperative or operative position; and

(b) when the engine is started, placing all connecting rods in a position at which the blades are in neutral position.

4,880,403

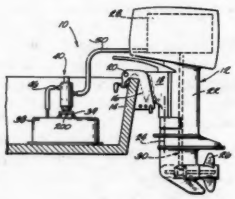
ANTI-SIPHON FUEL VALVE ASSEMBLY FOR MARINE INSTALLATIONS

Dennis J. Friedle, Lake Villa; Richard P. Kolb, Prairie View, and Kenneth M. McLeod, Lake Villa, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 29, 1987, Ser. No. 108,396

Int. Cl.[4] B63H *21/26;* B60R *25/04*

U.S. Cl. 440—88 **21 Claims**



21. A valve apparatus comprising a valve including an inlet and an outlet, set valve being locatable between a first state and a second state for respectively permitting and preventing fluid from said inlet to said outlet, solenoid means for changing the state of said valve, a valve switch actuatable between an open state and a closed state, and means responsive to the location of said valve in one of said first and second states for opening said valve switch and responsive to the location of said valve in the other of said first and second states for closing said valve switch.

4,880,404

PUPPET HAVING SLIDING FACE PANELS DEFINING A MOUTH OPENING

Leslie B. Derby, III, Mechanicsville, Va., assignor to Prescott Durrell & Company, Richmond, Va.

Filed Aug. 5, 1988, Ser. No. 228,513

Int. Cl.[4] A63H *3/14, 23/00, 33/00*

U.S. Cl. 446—329 **8 Claims**

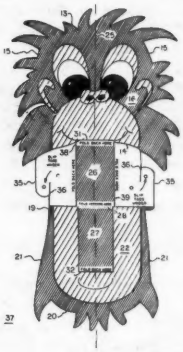
1. A puppet comprised of a single piece of substantially rigid sheet stock cut and folded so as to have:

(a) upper and lower flat face panels which in combination represent a familiar subject, each panel having upper, lower and side extremities, and front and rear surfaces, said panels having a common vertical axis, and adapted to slide in abutment upon each other in substantially coplanar relationship,

(b) a V-shaped hinge comprised of upper and lower arm panels emergent from an apex fold line and extending to distal extremities which join by way of second and third fold lines with said upper and lower face panels, respectively, said apex fold line being disposed rearwardly of said rear surfaces, parallel thereto and perpendicular to said vertical axis,

(c) finger engaging means associated with said upper arm panel, and

(d) an upwardly opening elongated slotted aperture disposed within said lower face panel in centered relationship to said vertical axis, and having a straight lower extremity which constitutes said third fold line, whereby



(e) said face panels can be manipulated to cause the upper face panel to slidably occlude portions of said slotted aperture, thereby presenting the illusion of a movable mouth.

4,880,405

UNIVERSAL JOINT OF THE CARDAN TYPE

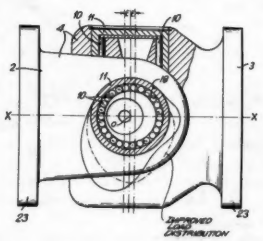
Eberhard Ende, Essen, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 9, 1987, Ser. No. 130,306

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3641956

Int. Cl.[4] F15D *3/41*

U.S. Cl. 464—14 **7 Claims**



1. A universal joint comprising:

first and second joint yokes **(2, 3)** each having a connecting end **(23)** with a pair of yoke arms **(4)**, a bore **(18)** in each yoke arm, the bores of each joint yoke lying on a different common axis and the axes of the bores of both joint yokes lying in a common plane, said connecting ends being located on opposite sides of said common plane; and

a trunnion cross **(5)** having four trunnions **(6, 7, 8, 9)** each mounted for rotation in a different one of the bores of said joint yokes for pivotally connecting said joint yokes together, said connected together joint yokes having an in-line position with a common rotation axis (x-x);

each trunnion having a radially outer end face with a recess **(14)** therein extending radially inwardly toward the center

of said cross, the recesses of the trunnions for one joint yoke being in axial alignment with each other; and

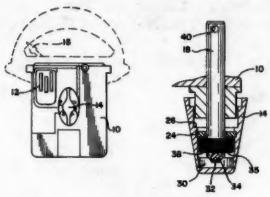
the recesses of the trunnions for each joint yoke being offset along said rotation axis from said common plane toward the connecting end of the joint yoke in which the trunnions are connected.

4,880,406

METER HANDLE MECHANISM

John W. Van Horn, and Clyde Johnson, both of Harrison, Ark., assignors to Duncan Industries Parking Control Systems Corp., Addison, Ill.

Filed May 31, 1988, Ser. No. 199,449
Int. Cl.[4] F16D 7/04
U.S. Cl. 464—38 **3 Claims**



1. A parking meter apparatus wherein time is purchased upon deposit of a token for achieving setting of a clock mechanism, a rotatable handle defining a hollow interior, a drive shaft connected between the clock mechanism and handle, and a clutch means positioned within said hollow interior for permitting selective driving of said shaft by said handle, said clutch means including releasable means engaging both said shaft and said handle, said releasable means comprising a pin, and a groove formed in said hollow interior for receiving said pin, a cap positioned within said handle, said cap defining a central opening for receiving said shaft, and said cap defining said groove for receiving said pin, said pin being connected to said drive shaft for rotation therewith, and spring means positioned within said hollow interior applying force to said pin, said spring means engaging said pin for pressing said pin into said groove, and said spring means comprising a stack of washers positioned around said shaft with at least one of said washers comprising a curved spring washer, application of excessive turning force to said handle resulting in disengagement of said pin from said groove permitting rotation of said handle relative to said shaft in opposition to the force applied by said spring means, said pin being relocated within said groove after removal of said excessive force and prior to further setting of said clock mechanism.

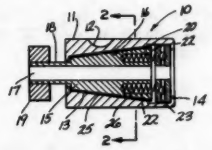
4,880,407

CONE CLUTCH

Philip H. Carton-Bacon, New Haven, Conn., assignor to Custom Products Corporation, New Haven, Conn.

Filed Feb. 16, 1988, Ser. No. 156,245
Int. Cl.[4] F16D 7/02
U.S. Cl. 464—43 **9 Claims**

1. A cone clutch comprising a housing member defining an internal frustro-conical continuous surface and having openings at either end thereof, an internal member having a mating frustro-conical continuous exterior surface received within said housing member, said housing member and said internal member being relatively rotatable, a layer of friction material disposed between said frustro-conical surfaces and being unbonded to either surface, and means biasing said internal member into engagement with said frustro-conical surface of said housing member, an extension portion on said internal member extending without said housing member, said internal member having a central passage longitudinally therethrough, said extension portion having a passage therethrough aligned with said passage in said internal member, and closure means in said housing member at the larger diameter end of said frustro-conical internal surface, said biasing means acting between said interior member and said end closure means, said closure



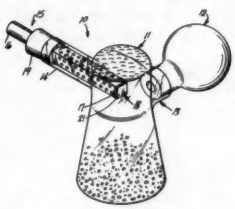
means having a passage therethrough axially aligned with said passage in said internal member and said extension portion whereby a through passage is defined through said clutch, said mating continuous frustro-conical surfaces providing the only journaling between said housing member and said internal member.

4,880,408

MEDICAL IRRIGATION DEVICE

David M. Cumes, 4147 Marina Dr., Santa Barbara, Calif. 93110, and Terence C. Honikman, 927 N. Kellogg Ave., Santa Barbara, Calif. 93111

Filed May 2, 1988, Ser. No. 189,220
Int. Cl.[4] A61M 5/18
U.S. Cl. 604—36 **10 Claims**



1. A medical irrigation device comprising a reservoir, a double-acting manually operable pump means, the reservoir having an inlet/outlet through which fluid may be displaced outwardly and inwardly by action of the pump means, a hollow member extending through the inlet/outlet the hollow elongate member having an open first end, positioned externally of the reservoir, adapted for connection to a resectoscope, and an open second end positioned within the reservoir, said second end being provided with a one-way valve means which allows fluid to pass into the reservoir, the hollow elongate member including a plurality of pores in the walls of portion of the hollow elongate member, said portion positioned within the reservoir and wherein said pores have a cross-sectional area substantially than the cross-sectional area of the second end of the hollow elongate member.

4,880,409

FEEDING DEVICE

Bengt Winblad, Inst. f. Seristrik, Karolimhe, S-14186 Huddinge, and Astrid Norberg, Inst. f. Omvardnadsforskning, Universitet, S-90187 Umea, both of Sweden

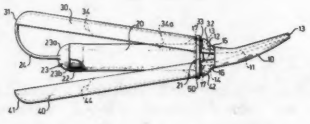
PCT No. PCT/SE87/00165, § 371 Date Feb. 22, 1988, § 102(e) Date Feb. 22, 1988, PCT Pub. No. WO87/06458, PCT Pub. Date Nov. 5, 1987

PCT Filed Mar. 31, 1987, Ser. No. 138,905

Claims priority, application Sweden, Apr. 21, 1986, 8601830

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—73 **9 Claims**



1. A device for feeding a dosage of nutrient into the mouth of a person, said device comprising

(a) a flexible tubular container (**20**) for receiving a said dosage;

(b) a spoon-like feeding head (**10**) connected to said container and having an internal longitudinal feeding channel (**11**) extending entirely therethrough;

(c) first and second handle pieces (**30, 40**) disposed on opposite sides of said container, said handle pieces being spaced apart in rest position, but being pivotable toward each other about respective pivot axes located between said container and said feeding head, so as to compress said container to force said dosage through said feeding channel into said mouth;

(d) each of said first and second handle pieces being provided with an internal, longitudinally extending rigid body tapered toward a front end thereof, for squeezing said tubular container when said handle pieces are pivoted towards each other.

4,880,410

DISPOSABLE SYRINGE

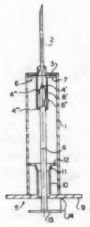
Rene T. M. Rossmark, Amsterdam, Netherlands, assignor to NV Medicopharma, Zaandam, Netherlands

Filed Apr. 20, 1988, Ser. No. 183,852

Claims priority, application Netherlands, Apr. 21, 1987, 8700947

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—110 **8 Claims**



1. A disposable syringe for medicinal or similar purposes, comprising a cylinder, an injection needle, a piston and a piston rod, and in which the piston may be moved out from a starting position within the syringe cylinder only once to suck a dose of injection liquid, and may thereafter be returned into the cylinder for carrying out an injection, whereas at the end of the injection stroke, the piston will enter into a position which makes it impossible to carry out another effective suction stroke, the syringe further comprising lost-motion connections means coupling the piston and the piston rod, said connection means being initially positioned so that the piston and the piston rod, as seen in the moving out direction are directly coupled; and locking means provided in an end portion of the cylinder turned away from the injection needle, said locking means being adapted to lock said piston and said piston rod in the direct coupling position along the initial portion of the injection stroke length corresponding to the length of said end portion of said cylinder such that, upon initiating of the injection stroke, a certain lost motion of the piston rod relative to said piston will take place only after a region of said cylinder comprising said locking means has been passed through.

4,880,411

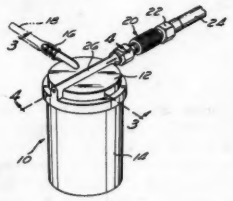
DISPOSABLE ASPIRATOR

Thomas F. Fangrow, Jr., Corona, and Sam C. Lim, Santa Ana, both of Calif., assignors to Life Support Products, Inc., Irvine, Calif.

Filed Apr. 1, 1988, Ser. No. 176,795

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—149 **5 Claims**



1. A disposable aspirator, comprising:

a plastic container having an open upper end;

a generally flat cover which mates with the open end of said container to close the container;

a gas flow tube formed unitary with said cover and extending diametrically across said cover in the general plane of the cover, said tube having a gas inlet end formed unitary with an enlarged connector that extends radially beyond the periphery of said cover, said tube further having an outlet end opposite from said inlet end and terminating substantially flush with the exterior of said cover;

a venturi positioned within said tube coaxial with said tube and having a restrictor section of reduced interior diameter, said venturi restrictor section being positioned much closer to said tube outlet than to said tube inlet;

said tube having a venturi opening formed therein extending from said restrictor section and opening into said container to form a flow path so that, when high velocity fluid flows through said tube and restrictor section, a vacuum is formed within said container; and

a fluid suction conduit formed unitary with said cover, said conduit forming a flow path between the interior of the container and the exterior of the container, whereby the vacuum within the container may be applied to a fluid outside of the container to draw the fluid into the container, said conduit including a fluid inlet portion having its axis generally in the plane of said cover, said conduit inlet portion having an inlet end which extends radially beyond the periphery of the cover and is adapted to be connected to tubing for aspirating fluids into the container, said conduit further including an outlet portion which extends downwardly towards the interior of the container, said outlet portion including an upper end which joins with said inlet portion and a lower outlet end which opens into the container, said conduit outlet por-

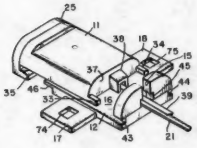
tion being positioned between and spaced from the upper end of the container and said gas flow tube.

4,880,412

TUBE INSERTION APPARATUS

Sol Weiss, 17227 Quesan Pl., Encino, Calif. 91316

Filed Feb. 9, 1988, Ser. No. 153,934
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—165 **18 Claims**



1. A device for inserting tubes of varying sizes into the body of a patient comprising:

at least a first upper needle half housing portion having a first elongated needle half arcuate in cross-section with a rear end secured to said upper needle half housing portion;

at least a second lower needle half housing portion having a second elongated needle half arcuate in cross-section with a rear end secured to said lower needle half housing portion, said lower needle half housing portion being flattened in the bottom for abutment against the skin of the patient;

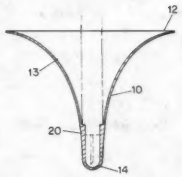
removable securement means associated with both needle half housing portions for removably securing the same together so that the mating needle halves meet at mating surfaces and form a cylindrical elongated needle receiving member extending from the secured portions, and said needle half housing portions also meeting at mating surfaces, said first elongated needle half including a first straight portion secured to said upper needle half housing portion at a point remote from the mating surfaces of said upper and lower needle half housing portions and extending generally parallel to the central axis thereof along an elongated axis spaced from the mating surfaces of said upper needle half housing portions, said first needle half also having a second angled portion integral with said first portion extending away from said first portion and beyond said upper needle half housing portion, said second elongated needle half including a first straight portion secured to said lower needle half housing portion at a point remote from the mating surface of said lower needle half housing portion and extending generally parallel to the central axis thereof along an elongated axis spaced from the mating surface of said lower needle half housing portion, said second needle half also having a second angled portion integral with said first portion of said second needle half extending from said first portion of said second needle half and beyond said lower needle half housing portions, each of said first and second angled portions extending toward each other, whereby the mating needle halves extending out of the upper and lower housing portions move to a mating position with their rear ends fixed in firm position in said respective upper and lower housing portions, and a keying slot formed by the securement of said needle half housing portions opposite the end thereof from which said needle halves extend for receiving the luer adaptor of a stylet therein.

4,880,413

SHARP INSTRUMENT PROTECTION MEANS

Kenneth A. Giuffre, and Michele A. Giuffre, both of 201 Sagamore La., Franklin Lakes, N.J. 07417

Filed Feb. 4, 1988, Ser. No. 152,167
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **3 Claims**



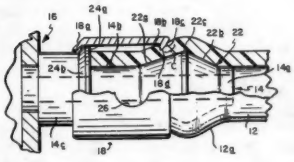
1. A disposable protective cover for an injection syringe, for receiving said syringe and preventing injury to the user after use thereof, comprising a housing member with circular symmetry about a longitudinal axis and having a first open axial end and a second closed axial end, said housing member having a hollow cavity extending from said open axial end, said cavity having a guiding portion adjacent said open end in the form of a continously curved funnel opening, said funnel opening having interior walls being continously curved to be almost perpendicular to said axis at said open end and substantially paralled to the axis beginning at a point closer to the closed axial end of the funnel than to the open end of the funnel said cavity having a cylindrically shaped syringe retaining portion extending from said point to said closed end of said housing, the wall of said syringe retaining portion being radially thickened inwardly at least at said point to thereby form an interior step and configured throughout its length to grip and retain an inserted syringe.

4,880,414

CATHETER ATTACHMENT SYSTEM

Gary R. Whipple, South Attleboro, Mass., assignor to Pharmacia Nu Tech, Walpole, Mass.

Filed Dec. 31, 1987, Ser. No. 140,026
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—283 **16 Claims**



1. Connection apparatus comprising

A. a relatively rigid elongated stem, said stem having a free end, an opposite end and means defining an enlargement on the exterior surface of the stem at a selected location between said ends;

B. a flexible elastic tube having a lumen for elastically receiving a lengthwise segment of said stem including said enlargement thereof, said enlargement having a maximum diameter appreciably larger than that of the lumen so that when said stem segment is received in the lumen, said tube is stretched conformingly around said stem enlargement; and

C. tubular retainer means slidably received on said stem between said tube opposite end and said enlargement, said retainer means including radially inwardly extending rigid

flange means at or near a distal end of said retainer means that faces said enlargement, said flange means having a fixed diameter that is less than the maximum diameter of said stem segment plus twice the wall thickness of said tube when engaged elastically on said stem segment so that when said stem segment is received in the tube lumen and said retainer means are slid toward the free end of said stem, said flange means compressively engage the elastically stretched wall of said tube at a contact surface that encircles a segment of said enlargement.

4,880,415

WARM BATH FOR HANDS AND FEET

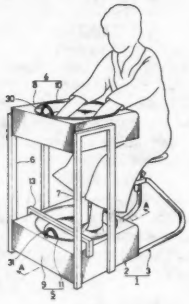
Hideaki Urakami, 6-18, Hibarigaoka 1-chome, Takarazuka-shi, Hyogo 665, Japan

PCT No. PCT/JP86/00230, § 371 Date Dec. 22, 1987, § 102(e) Date Dec. 22, 1987, PCT Pub. No. WO87/06454, PCT Pub. Date Nov. 5, 1987

PCT Filed May 2, 1986, Ser. No. 160,604

Int. Cl.[4] A61F *7/00*

U.S. Cl. 604—291 **9 Claims**



1. A warm bath for simultaneously soaking and warming the hands and feet in a bathing agent consisting mainly of wax, the combination comprising an upper container overlying a lower container with each containing said bathing agent, connecting means connecting said upper container to said lower container, said upper and lower container each having a bottom wall and a peripheral side wall which is generally upright, said bottom wall and peripheral side wall of each container each comprising a base structure and an inner layer on said base structure, said inner layer being made of a corrosion-resistant material, abutting means on at least one of said containers for facilitating removal of wax from a person's body part, said at least one container having a top opening, said abutting means comprising a bar member mounted on said base structure and extending over said top opening of said container, said bar member having an L-shaped configuration including a first horizontal leg and a downward depending vertical leg, said vertical leg having a terminating end operable to remove said wax from a person's body parts, said base structure having a bottom outer surface juxtaposed to said bottom wall and a side outer surface juxtaposed to said side wall, first electric heater means on said bottom outer surface, second electric heater means on said side outer surface, a temperature sensor means for detecting the temperature of said bathing agent in each of said containers, and temperature control means operably connected between said temperature sensor means and said first and second electric heater means for controlling the temperature of said bathing agent in each of said containers, whereby the entire volume of the bathing agent in each of said upper and lower containers is uniformly heated by said first and second electric heater means and the temperature of the bathing agent in said upper and lower containers is maintained substantially even at all locations in the respective container by said first and second electric heater means.

4,880,416

DERMAL BANDAGE AND DERMAL PREPARATION

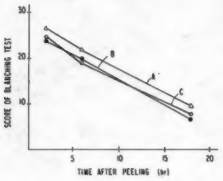
Tetsuo Horiuchi, and Yuichi Inoue, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 929,115, Nov. 10, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 266,318

Claims priority, application Japan, Nov. 8, 1985, 60-251734; Sep. 9, 1986, 61-212970

Int. Cl.[4] A61F *13/02*

U.S. Cl. 604—307 **24 Claims**



1. A dermal bandage comprising a film-like adhesive material comprising:

(a) vinyl acetate polymer and

(b) at least one of polycarboxylic acid and polycarboxylic acid anhydride; wherein if a polycarboxylic acid is used, then said film-like adhesive material comprises 20% by weight or more of a —COOH group, and if a polycarboxylic acid

anhydride is used, then said film-like adhesive material comprises 16% by weight ormore of a —CO—O—CO— group; and wherein a ratio of the polycarboxylic acid and/or polycarboxylic acid anhydride to the vinyl acetate polymer is in such a range that a value defined by formula:

$$\frac{\text{Weight of —COOH in Film-like Adhesive Material} + \frac{5}{4}\text{Weight of —CO—O—CO— in Film-like Adhesive Material}}{\text{(Weight of Polycarboxylic Acid + Weight of Vinyl Acetate Polymer) in Film-like Adhesive Material}} \times 100$$

4,880,417

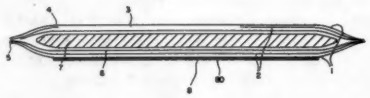
DEODORIZING AND SOUND MUFFLING ANAL PAD

Alexander A. Yabrov, Princeton, and Michael Roitberg, Highland Park, both of N.J., assignors to Biological Resistance, Inc., Princeton, N.J.

Filed Oct. 16, 1987, Ser. No. 109,152

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—355 **7 Claims**



1. An anal pad comprising:

an outer shell having an interior surface;

a semi-rigid inner shell enclosed within said outer shell and fully lining an interior surface of said outer shell along a first side of said outer shell adapted to be adjacent to a user's undergarment and partially lining an interior surface of a second side of said outer shell opposite said first

side and adapted to be adjacent to the user's anus so as to form a central slot in said outer shell; and

an absorbing layer located within said semi-rigid inner shell and filling the interior space of said anal pad and supporting said semi-rigid linings in spaced apart relationship to form a sound reflecting chamber, said absorbing layer trapping fecal matter and absorbing the odor of gas expulsed from the anus by flatus, and trapping the sound of flatus.

4,880,418

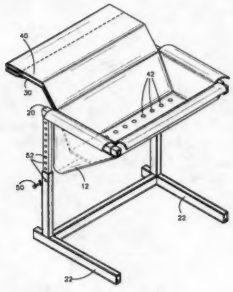
OBSTETRIC SAFETY DEVICE

Charles V. Tramont, 929 Mennonite Rd., Mantua, Ohio 44255

Continuation-in-part of Ser. No. 30,168, Mar. 25, 1987, abandoned, which is a continuation of Ser. No. 795,513, Nov. 6, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 160,815

Int. Cl.[4] A61B *17/42*

U.S. Cl. 604—356 11 Claims



1. In an environment designed for facilitating a practitioner's assisting a pregnant woman in the delivery of her child, which environment comprises a first support means that supports the woman at a convenient and stable elevation above the floor, which first support means may be a delivery table or birthing bed, birthing chair, birthing stool, for examples; the improvement being an apparatus comprising a substantially planar safety net with openings through the thickness thereof in combination with a flexible baglike hygienic disposal receptacle having an opening wherein said net and said receptacle are releasably supported by means of and in combination with a second support means so the net is in a substantially horizontal orientation within the opening of said disposal receptacle, said disposal receptacle being capable of collecting and holding the wastes incident to the birthing process.

4,880,419

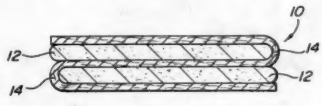
ABSORBENT ARTICLE WITH INTERNAL WICKING MEANS

Irving S. Ness, Palmetto Dunes, S.C., assignor to Chicopee, New Brunswick, N.J.

Continuation of Ser. No. 152,208, Feb. 3, 1988, Pat. No. 4,842,594, which is a continuation of Ser. No. 889,448, Jul. 23, 1986, abandoned, which is a continuation of Ser. No. 721,832, Apr. 10, 1985, which is a continuation-in-part of Ser. No. 525,850, Aug. 24, 1983, abandoned. This application Dec. 14, 1988, Ser. No. 284,049

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—368 13 Claims



1. An absorbent article comprising at least two discrete superabsorbent containing layers and a continuous wicking means extending about and between the superabsorbent containing layers.

4,880,420

MULTIPLE STRAND ELASTIC MEANS

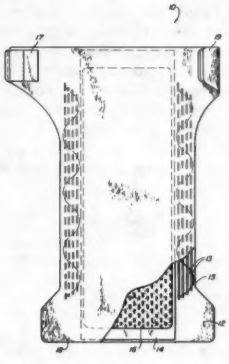
Vincent Pomparelli, Parlin, N.J., assignor to McNeil-PPC, Inc., Milltown, N.J.

Filed Aug. 17, 1984, Ser. No. 641,665

The portion of the term of this patent subsequent to Feb. 14, 2004, has been disclaimed.

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385.1 3 Claims



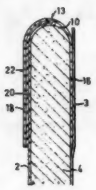
1. In a disposable diaper having elastic leg portions, said diaper comprising a liquid impermeable backing sheet, a liquid permeable facing sheet and an absorbent core disposed between said facing sheet and said backing sheet, the improvement comprising said elastic leg portions being formed by a multiplicity of substantially parallel unconnected strands of stretched elastic adhered between the facing sheet and the backing sheet by at least one continuous sinusoidal adhesive line, said adhesive line extending beyond at least one elastic strand on each side of said strand as well as across said strand and said adhesive line adhering not only at least one elastic strand but also adhering said facing layer to said backing layer.

4,880,421

DISPOSABLE ABSORBENT ARTICLE SUCH AS A DIAPER OR AN INCONTINENCE PROTECTOR

Urban Widlund, Mölnlycke, Sweden, assignor to Molnlycke AB, Goteborg, Sweden

Filed Nov. 23, 1987, Ser. No. 123,949
Claims priority, application Sweden, Nov. 26, 1986, 8605069
Int. Cl.[4] A01F *13/16*
U.S. Cl. 604—385.2 4 Claims



1. A disposable absorbent article such as a diaper or an incontinence protector, having pressure-adhesive tape tabs for securing the article in a pant-like manner around the user's waist, the article being elongated and having opposite ends and longitudinal sides extending between said opposite ends, the article comprising an absorption body, a liquid impermeable outer layer on one side of the absorption body and a liquid permeable inner layer on the other side of the absorption body, said layers being united at least along said longitudinal sides, said pressure-adhesive tape tabs being disposed at one end of the article and being adapted to contact the other end of the article when securing the article about the user'waist, on the same side of the article as said liquid impermeable outer layer, and a strip of liquid permeable material extending transversely of the length of the article at least at said other end of the article, said strip having a portion secured between the absorption body and the liquid permeable inner layer and a portion which extends over a transverse edge of the absorption body at said other end and is directly secured to the liquid impermeable outer layer on the side of the liquid impermeable outer layer opposite the absorbent body, whereby the article has a reinforced attachment area where the liquid impermeable outer layer and said strip overlap and are directly secured together, for receiving the tape tabs, and a liquid impermeable lining around at least part of the waist opening of the article.

4,880,422

REFASTENABLE DIAPER SHEET

Robert K. McBride, Jasonville, Ind., assignor to Tredegar Industries, Inc., Richmond, Va.

Filed Jul. 5, 1988, Ser. No. 215,418
Int. Cl.[4] A41B *13/02*
U.S. Cl. 604—389 20 Claims

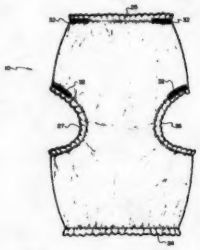
1. A refastenable disposable diaper comprising a facing sheet, a backsheet, an absorbent panel positioned between said facing sheet and said backsheet and an adhesive tab fastener means having a first end fixedly attached to said backsheet and a second end refastenably attachable to said backsheet, said backsheet being characterized by comprising a resin blend consisting essentially of polypropylene and a polyethylene selected from the group consisting of LDPE, LLDPE, LMPDE or a mixture of any two of the foregoing in which from 3 to 30 weight percent of the resin blend is polypropylene, and by (ii) having a transverse direction tensile strength value at 10 percent elongation of at least 515 grams and a 120° tab adhesion value of at least 380 grams, whereby said second end of said tab fastener is non-destructably detachable from said backsheet.

4,880,423

DISPOSABLE UNDERPANTS

Lyel A. Green, 5650 S. 2580 West, Roy, Utah 84067

Filed Mar. 2, 1988, Ser. No. 163,251
Int. Cl.[4] A41B *13/02*
U.S. Cl. 604—391 1 Claim



1. A disposable underpants comprising

a sheet of composite materials including a waterproof layer and at least one absorbent layer cut to an hourglass shape having a front portion with a front edge, a back portion with a back edge, a crotch portion between the front and back portions and leg openings at opposite sides thereof extending between side edges of the front portion and side edges of the back portion;

strips of elastic sewn to the sheet along the front and back edges and along the leg openings;

strips of hooked material sewn to and overlying ends of the elastic strips adjacent the leg openings at the front portion and to and overlying ends of the leastic at the front edge of the absorbent layer face of the sheet of compsite materials; and

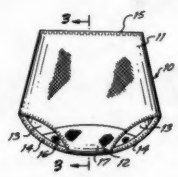
strips of napped material sewn through the sheet of composite material to and overlying opposite ends of the elastic means at the leg openings and to and overlying ends of the elastic strip at the back edge.

4,880,424

PROTECTIVE UNDERGARMENT FOR THE RETENTION OF BODY FLUIDS

Leonard J. Rautenberg, Sands Point, N.Y., assignor to Darlington Fabrics Corporation, New York, N.Y.

Filed Feb. 4, 1988, Ser. No. 152,182
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—396 5 Claims



1. A re-usable garment to be worn on the lower part of the body for the retention of body fluids, comprising:

a body portion of a breathable, elastic, fiber-containing material and a crotch portion; said body portion having a waist opening and said body portion and crotch portion forming leg openings, said crotch portion being sewn to said body portion; and

said crotch portion being liquid-proof, breathable and elastic for the retention of body fluids and including a laminated fabric having a liquid-proof, breathable, elastic thermo-

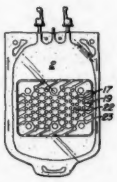
plastic film inner layer and a breathable, stretch, fiber-containing material outer layer having substantial elastic qualities, said film of said film layer being a polymer film having a thickness less than 1.0 mil and having elastic qualities comparable to said stretch material; and an adhesive bonding said film layer to said layer of stretch material, said adhesive being present in substantially discontinuous segments; the material of said body portion and the material of said crotch portion outer layer being substantially similar so as to provide a uniform outer appearance of the garment similar to that of a conventional undergarment.

4,880,425

BLOOD BAG HAVING LABEL PROVIDING ENHANCED GAS TRANSMISSIBILITY

Bruce W. Kuhlemann, Hayward; Agilio E. Macabasco, and Renato R. Salumbides, both of San Dimas, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 8, 1984, Ser. No. 618,716
Int. Cl.[4] A61J *1/00*
U.S. Cl. 604—404 **7 Claims**



1. A blood or blood component container, the container demonstating gas transmissibility, and having affixed directly thereto a label, the label having an outwardly facing surface adapted to provide useful printed information and an inwardly facing surface, the inwardly facing surface having both raised and depressed portions, the raised portions comprising less than about 50% of the total inner surface area of the label and the depressed portions being interconnected and in communication with the periphery of the label to facilitate gas transmission between the interior of the container and the atmosphere surrounding the bag.

4,880,426

HAPTIC TO OPTIC ATTACHMENT FOR A SOFT IOL

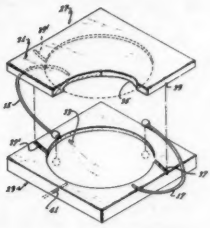
Albert C. Ting, Laguna Niguel; Timothy R. Willis, El Toro; F. Richard Christ, Orange; Steven R. Bacich, Irvine; Dean K. Pettit, Irvine; Stanley L. Van Gent, Irvine, and Jeffrey C. Day, Mission Viejo, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 96,745, Sep. 15, 1987, Pat. No. 4,790,846, which is a continuation of Ser. No. 806,376, Dec. 9, 1985, abandoned. This application Aug. 4, 1988, Ser. No. 228,709
Int. Cl.[4] A61F *2/16*; B29D *11/00*
U.S. Cl. 623—6 **12 Claims**

1. An intraocular lens comprising:

at least one fixation member having a proximal end portion, said proximal end portion including a filament and a bulbous configuration coupled to the filament and adapted to form a mechanical interlock; and

an optic cast about said bulbous configuration and the proximal end portion to form a mechanical interlock between



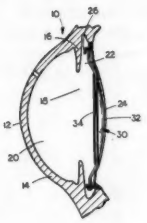
said bulbous configuration and the optic and to attach the fixation member to the optic.

4,880,427

FLEXIBLE POSTERIOR CHAMBER LENS

Aziz Y. Anis, 9540 Firethorne La., Lincoln, Nebr. 68520

Continuation of Ser. No. 624,232, Jun. 25, 1984, abandoned. This application May 17, 1988, Ser. No. 201,388
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 **7 Claims**



1. A flexible posterior chamber lens, for implantation within an eye, comprising:

a disc-shaped lens body having a front face, a convex rear face, and an outer peripheral edge;

flexible holding means secured to and extending around substantially the entire peripheral edge of said lens body and having an outer end disposed forwardly of said convex rear face in a plane perpendicular to the optical axis of said lens body so that said holding means will engage substantially the entire capsular equator when the lens is implanted to reduce cellular migration into and the opacification of the posterior capsule;

said lens body and flexible holding means being made of PMMA;

said holding means and said lens body are of one-piece construction;

said holding means including only one post member radially extending from the lens body and at least one fixation means;

said fixation means being entirely separated from said lens body by said one support post member.

4,880,428

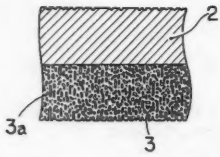
MATTED (DELUSTERED) ARTIFICIAL HAIR

Shiro Yamada, No. 2-7-1-606, Mita, Minato-ku, Japan

Filed Apr. 19, 1988, Ser. No. 183,224
Int. Cl.[4] A61F *2/10*
U.S. Cl. 623—15 **6 Claims**

1. An artificial hair having a delustered surface closely simi-

lar in gloss to that of human hair, comprising a melt-spun synthetic resin monofilament having a generally circular cross-section and an exterior surface having a large number of scrubbed flaws of irregular size and shape extending generally circumferentially about said monofilament, said scrubbed flaws extending transverse to the length of said monofilament, the surface of said monofilament being substantially devoid of scrubbed flaws extending in the longitudinal direction of said monofilament.

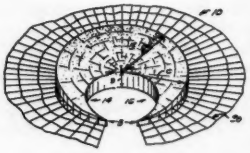


4,880,429

PROSTHETIC MENISCUS

Kevin R. Stone, 133 Retiro Way, San Francisco, Calif. 94123

Filed Jul. 20, 1987, Ser. No. 75,352
Int. Cl.[4] A61F 2/30
U.S. Cl. 623—18 12 Claims



1. A prosthetic meniscus comprising a porous dry volume matrix of Type I collagen fibers interspersed with glycosaminoglycan molecules, wherein said matrix has a substantially wedge shape including a wide central region between two narrow distal tip regions, wherein said collagen fibers are present at a concentration of about 65%–98% by dry weight, wherein said glycosaminoglycan molecules are present at a concentration of about 1%–25% by dry weight, and wherein at least a portion of said molecules provide glycosaminoglycan crosslinks between said collagen fibers, said crosslinks being dispersed substantially nonuniformly throughout said matrix, and said crosslinks having relatively high density at said tip regions and relatively low density at said central region, and wherein said matrix has a pore size substantially in the range 10–50 microns, whereby said matrix establishes an at least partially bioresorbable scaffold adapted for ingrowth of meniscal fibrochondrocytes.

4,880,430

MIXTURES OF AN ACYLATED POLYAMINE AND AN ALCOHOL-ETHER USEFUL FOR TEXTILE FINISHING

Eckart Schlensener, Reinach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 31, 1988, Ser. No. 175,566

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711440

Int. Cl.[4] D06M *13/40, 15/61*

U.S. Cl. 8—188 50 Claims

1. A water-dilutable mixture of

(a) an acylated polyamine derivative selected from the group consisting of:

1. a polyamine acylated by introduction of at least one radical of a C_{12-24}-fatty acid and oxyalkylated,

2. an alkylated derivative of 1.,

3. a quaternated derivative of 1. or 2.,

4. a protonated derivative of 1., 2. or 3.,

or a mixture thereof and

(b) an alcohol-ether of the average formula

$$R—O—CH_2—CH_2—O)_nH \quad (I),$$

wherein R is C_{1-4}-alkyl

and n is a number from 3 to 12.

4,880,431

ARYL MONOAZO PYRIDONE YELLOW COMPOUND HAVING TWO VINYLSULFONE TYPE FIBER REACTIVE GROUPS BONDED TO A TRIAZINE RING FOR DYEING CELLULOSE OR POLYAMIDE

Kazufumi Yokogawa, Minoo; Naoki Harada, Suita, and Takashi Omura, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

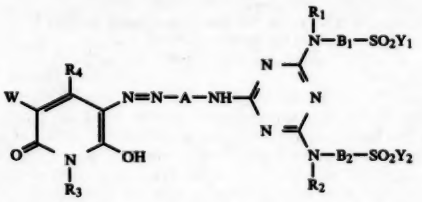
Filed Dec. 8, 1987, Ser. No. 130,293

Claims priority, application Japan, Dec. 24, 1986, 61-310455

Int. Cl.[4] C09B *62/51;* D06P *1/38*

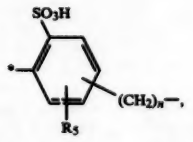
U.S. Cl. 8—549 10 Claims

1. A compound represented by the following formula (I),



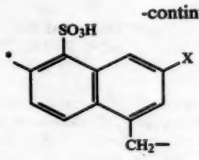
(I)

wherein R_1 and R_2 independently of one another are each hydrogen or unsubstituted or substituted alkyl, R_3 is hydrogen or alkyl, R_4 is alkyl or carboxy, A is a divalent group represented by the following formula (II) or (III) in each free acid form,



(II)

-continued



(IIII)

in which R_5 is hydrogen, methyl, methoxy, ethoxy, sulfo or carboxy, X is hydrogen or sulfo, n is 0 or 1, and the asterisked linkage bonds to the azo group, B_1 and B_2 independently of one another are each phenylene unsubstituted or substituted once or twice by methyl, methoxy, ethyl, ethoxy, chloro, bromo, sulfo or carboxy, or naphthylene unsubstituted or substituted by sulfo, W is hydrogen, carbamoyl, sulfoalkyl, cyano, sulfo, chloro or bromo, and Y_1 and Y_2 independently of one another are each $—CH=CH_2$ or $—CH_2CH_2Z$ in which Z is a group splittable by the action of an alkali.

4,880,432

PROCESS FOR PREPARING COLORED PARTICLES AND LIQUID DEVELOPER COMPOSITIONS THEREOF

Luke S. Egan, Kingston; Mitchell A. Winnik, and Francoise M. Winnik, both of Toronto, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1988, Ser. No. 143,790

Int. Cl.[4] C09B *69/10*

U.S. Cl. 8—647 30 Claims

1. A process for preparing particles colored with a dye which comprises: (a) forming, by a free radical dispersion polymerization process in a nonaqueous solution, polymeric particles with an average diameter of from about 0.1 to about 20 microns and comprising macroscopic polymeric core particles having attached thereto stabilizing copolymers with at least one functional group capable of undergoing a chemical reaction with a dye; (b) adding a dye to said polymeric particles; and (c) effecting a chemical reaction between said dye and said stabilizing copolymers, thereby resulting in said dye becoming covalently bonded to the stabilizing copolymer portions of said polymeric particles.

4,880,433

PROCESS FOR AFTERTREATING CELLULOSIC MATERIALS PRINTED WITH REACTIVE DYES

Wolfgang Sütterlin, Lörrach-Haagen, Fed. Rep. of Germany, and Raymond Défago, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 27, 1987, Ser. No. 7,835

Claims priority, application Switzerland, Jan. 29, 1986, 327/86

Int. Cl.[4] D06M *1/00*

U.S. Cl. 8—182 10 Claims

1. A process for aftertreating cellulose or cellulosic materials printed with reactive dyes, which comprises using an aqueous aftertreatment liquor that contains at least one cationic assistant in an amount effective to improve wetfastness properties of the dyed material, and 0.1 to 3 g/l of at least one member selected from the group consisting of an amphoteric fluorescent whitening agent and a cationic fluorescent whitening agent.

4,880,434

METHOD OF OBTAINING DYED AND FINISHED CELLULOSE FIBER MATERIALS USING REACTIVE METALLIZED FORMAZAN DYE WITH NO COLOR CHANGE

Naoki Harada, Suita; Tetsuya Miyamoto, Takatsuki; Kunihiko Imada, Sakai, and Takashi Omura, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

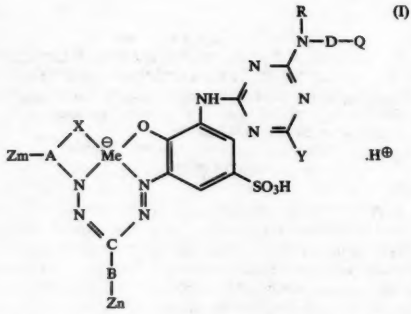
Filed Jul. 12, 1988, Ser. No. 217,631

Claims priority, application Japan, Jul. 23, 1987, 62-185283; Jul. 30, 1987, 62-191943

Int. Cl.[4] D06P *3/66, 5/06, 1/38*

U.S. Cl. 8—549 8 Claims

1. A method for producing dyed and finished products of cellulose fiber materials, which comprises dyeing cellulose fiber materials with a dye represented by the following formula (I) in the free acid form,



(I)

wherein A is a substituted or unsubstituted phenylene or naphthylene group, B is a straight or branched alkyl or alkenyl group or a phenyl, naphthyl or heterocyclic group, the alkyl, alkenyl, phenyl, naphthyl and heterocyclic groups being substituted or unsubstituted, Me is an ion of a metal having an atomic number of from 27 to 29, X is —O— or

Y is a substituted or unsubstituted lower alkoxy or phenoxy group or $—NR_1R_2$ in which R_1 and R_2 independently of one another are each a hydrogen atom or a substituted or unsubstituted lower alkyl, phenyl, naphthyl or benzyl group, Z is a water-solubility-imparting group, m and n are each 0 or an integer of 1 to 3, provided that the sum of m and n is 1 to 3, D is a substituted or unsubstituted phenylene or naphthylene group, Q is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2L$ in which L is a group splittable by the action of an alkali, and R is a hydrogen atom or a substituted or unsubstituted lower alkyl group, and then finishing the dyed fiber materials with a fixing agent or/and a finishing agent capable of bonding with cellulose through a bridge formation.

4,880,435

ALKALINE STORAGE CELL AND MANUFACTURING METHOD THEREFOR

Tsukasa Itou; Ryuji Kawase, both of Sumoto; Yuji Morioka, Hyogo, and Masao Ichiba, Sumoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 19, 1988, Ser. No. 195,755

Claims priority, application Japan, May 20, 1987, 62-123312; Nov. 27, 1987, 62-300516; Dec. 16, 1987, 62-319310; Dec. 17, 1987, 62-320224; Jan. 11, 1988, 63-3345

Int. Cl.[4] H01M *4/26*

U.S. Cl. 29—623.5 6 Claims

1. A method of manufacturing a rechargeable alkaline storage cell comprising:

a first step of forming a cadmium electrode by coating a conductive support with an active material in paste form, the active material in paste form having been obtained by kneading active material powder including cadmium oxide as a main component thereof and an aqueous solution of an oxyacid salt which suppresses hydration of the cadmium oxide into cadmium hydroxide,

a second step of converting substantially all of the cadmium oxide to cadmium hydroxide by immersing said cadmium electrode in an aqueous alkaline solution of hydration, and

a third step of forming a spiral wound electrode by winding said cadmium electrode subjected to hydration and a positive electrode with a separator therebetween and incorporating said spiral wound electrode into a cell can.

4,880,436

METHOD FOR CONTROLLING VISCOSITY OF ORGANIC LIQUID AND COMPOSITIONS

Kissho Kitano, Ohi, Japan; Ilan Duvdevani, Leonia, and Donald N. Schulz, Annandale, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

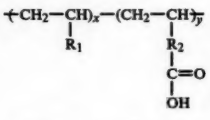
Continuation-in-part of Ser. No. 806,416, Dec. 9, 1985, Pat. No. 4,715,865, which is a continuation-in-part of Ser. No. 625,974, Jun. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 565,106, Dec. 23, 1983, abandoned. This application Nov. 20, 1987, Ser. No. 123,393

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[4] C10L *7/00*

U.S. Cl. 44—7.3 3 Claims

1. A method of viscosifying an organic liquid from about 10 to about 10,000 cps for polymer concentrations of less than about 10.0 wt.% which method comprises adding a sufficient quantity of a hydrolyzed ester containing copolymer of an alpha-olefin and a vinyl alkylenecarboxylic acid copolymerized in the presence of a Ziegler-Natta catalyst having an acid content of from about 0.01 to 10 mole percent and a molecular weight of about 100,000 to about 10,000,000 wherein said copolymer of said alpha-olefin and said vinyl alkyl-enecarboxylic acid has the formula:



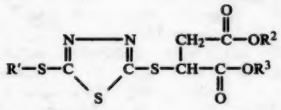
wherein R_1 is an alkyl group having 6 carbon atoms, R_2 is an alkylene group having 3 to 16 carbon atoms, x is about 95.0 to about 99.95 mole % and y is about 0.05 to about 5.0 mole %.

4,880,437
FUEL COMPOSITIONS CONTAINING MALEIC DERIVATIVES OF 2,5-DIMERCAPTO-1,3,4-THIADIAZOLE

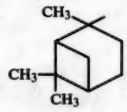
Thomas J. Karol, Norwalk, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Mar. 21, 1988, Ser. No. 171,089
Int. Cl.[4] C10L 1/10
U.S. Cl. 44—57 **5 Claims**

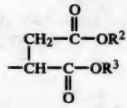
1. A diesel fuel composition characterized by improved wear properties and comprising a major portion of middle distillates boiling in the range of about 163° to 400° C. and a minor wear improving amount of a reaction product of a maleic compound and 2,5-dimercapto-1,3,4-thiadiazole selected from the group of compounds having the structural formula



wherein R′ represents hydrogen, pinene residue of the formula



and maleic acid residue of the formula



and R^2 and R^3 represent C_{1-22} alkyl and C_{5-7} cycloalkyl groups and either R^2 or R^3 may be hydrogen; neutralization salts of said compounds and mixtures thereof.

4,880,438
DIP TUBE WITH JACKET

Alfred L. Den Bleyker, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 10, 1989, Ser. No. 311,266
Int. Cl.[4] C10J 3/48, 3/84
U.S. Cl. 48—69 **4 Claims**

1. In a gasification reactor for combusting a carbonaceous fuel to produce a hot effluent stream comprised primarily of a usable gas, said reactor including:

an elongated shell,

means forming a refractory lined combustion chamber in said shell,

burner in said shell communicated with a pressurized source of a carbonaceous fuel mixture, to discharge a flow of the fuel mixture into the combustion chamber,

means forming a quench chamber in said shell including a liquid bath beneath said combustion chamber,

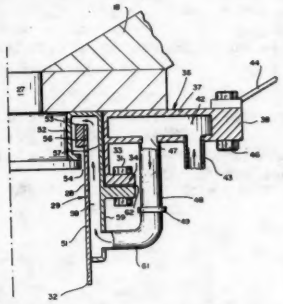
means forming a constricted throat communicating the combustion chamber with said quench chamber for conducting said produced hot effluent stream,

a quench ring in said quench chamber having means forming an annular coolant chamber communicated with a pressurized water source,

a dip tube assembly depending from said quench ring and including:

a toroidal body having an annular channel and at least one discharge port from said channel,

a cylindrical dip tube depending from said toroidal body having an inner surface which defines a guide passage for the hot effluent leaving the combustion chamber and having an outer surface,



a panel spaced from said dip tube and depending therefrom to define an intermediate jacket communicated with the annular coolant chamber and with said annular channel, respectively,

said at least one discharge port being directed into said dip tube guide passage.

4,880,439
HIGH TEMPERATURE DESULFURIZATION OF SYNTHESIS GAS

Mitri S. Najjar, Hopewell Junction, N.Y., and Allen M. Robin, Anaheim, Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed May 5, 1988, Ser. No. 190,707
Int. Cl.[4] C10J 3/46
U.S. Cl. 48—197 R **22 Claims**

1. A continuous process for the production of desulfurized synthesis gas, fuel gas, or reducing gas comprising:

(1) reacting sulfur-containing heavy liquid hydrocarbonaceous fuel and/or sulfur-containing solid carbonaceous fuel by partial oxidation with a free-oxygen containing gas and in the presence of a temperature moderator in the free-flow refractory lined reaction zone of a gas generator at an autogenous temperature in the range of about 1900° F and above the ash-fusion temperature of the slag formed in the reaction zone, and a pressure in the range of about 2 to 250 atmospheres to produce a hot stream of synthesis gas, reducing gas, or fuel gas comprising H_2, CO, CO_2, H_2S, COS and at least one gaseous material selected from the group consisting of H_2O, N_2, CH_4, NH_3, Ar, and containing entrained material comprising particulate carbon, and molten slag;

(2) passing the hot gas stream from (1) through an unobstructed central passage of a radiant cooler, thereby cooling the process gas stream to a temperature in the range of about 1800° F. to 1200° F. while solidifying the molten slag;

(3) contacting the sulfur-containing gases in the process gas stream in said radiant cooler with a calcium-containing material after substantially all of the said molten slag has solidified, wherein said calcium-containing material is introduced into the cooled process gas stream at one or more locations within said radiant cooler, the weight ratio of calcium-containing material to sulfur is in the range of about 0.8 to 5.0 to 1.0; and the partial pressure of oxygen in the radiant cooler is in the range of less than about 1.7×10^{31} [15] atmospheres at a temperature of about 1800°

F. and less than about 5.3×10^{31} [23] atmospheres at a temperature of about 1200° F.;

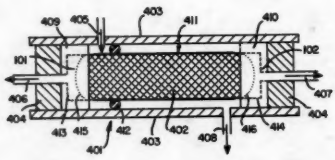
(4) reacting in said radiant cooler said calcium-containing material with sulfur-containing constituents in said gas stream to produce particulate matter comprising calcium sulfide; and

(5) discharging from said radiant cooler a partially cooled process stream of synthesis gas, reducing gas, or fuel gas containing entrained calcium sulfide particulate matter, particulate carbon, and slag; and in comparison with a gas stream produced without the introduction of said calcium-containing additive in (3), said cooled process gas stream contains a reduced amount of sulfur-containing gases.

4,880,440
HOLLOW FIBER MULTIMEMBRANE CELLS AND PERMEATORS

Jerry Perrin, Charlestown, Mass., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 12, 1988, Ser. No. 242,604
Int. Cl.[4] B01D 53/22
U.S. Cl. 55—16 9 Claims



4. A unified multimembrane permeation cell comprising a multi permeable membrane unit comprised of at least two different hollow fiber permeable membranes wound in essentially intimate contact with each other and having a central body portion and stub ends, said central body portion comprising essentially said different hollow fiber permeable membranes in alternating contact with each other, and said stub ends each comprising essentially one of said hollow fiber permeable membranes.

7. A process for simultaneously recovering at least two different permeate streams from a multicomponent feed stream, wherein one or more permeate stream is enriched in at least one component of said feed stream and simultaneously recovering an unpermeated raffinate stream diminished in concentrations of the materials comprising the permeate streams, which comprises bringing said multi component feed stream into contact with a unified multimembrane permeation cell claimed in claim 4 and recovering said permeate and raffinate streams.

4,880,441
ASYMMETRIC GAS SEPARATION MEMBRANES HAVING GRADED DENSITY SKINS

Robert E. Kesting, Elsenfeld, Fed. Rep. of Germany; Alfred K. Fritzsche, Manchester; Milton K. Murphy, Clayton, both of Mo.; Alan C. Handerman, Matthews, N.C.; Clint A. Cruse, St. John, Mo., and Raymond F. Malon, Edmundson, Mo., assignors to Permea, Inc., St. Louis, Mo.

Continuation of Ser. No. 66,752, Jul. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 896,990, Aug. 25, 1986, abandoned. This application Jan. 12, 1989, Ser. No. 296,843
Int. Cl.[4] B01D 53/22
U.S. Cl. 55—16 32 Claims

1. A process for the separation of at least one gas of a gaseous mixture from at least one other gas in said gaseous mixture by selective permeation and providing a permeated product containing at least one permeating gas comprising:

a. contacting the gaseous mixture with a first surface of a multicomponent gas separation membrane having a graded density skin and essentially macrovoid-free morphology comprised of glassy, hydrophobic polymers, the graded density skin membrane having increased free volume as evidenced by the membrane first heat T_g which is greater than the T_g of a bulk sample of the glassy hydrophobic polymers, the graded density skin membrane formed from a dope having a g value of no greater than 2, the polymers of the membrane having a separation factor for the at least one gas of a gaseous mixture over that of one or more remaining gases of the gaseous mixture which when combined with a coating in occluding contact with the graded density skin membrane provides a multicomponent gas separation membrane which exhibits a selective permeability characterized by at least a 50 percent increase for the at least one gas of the gaseous mixture while maintaining an essentially constant or improved separation factor for the at least one gas of the gaseous mixture when compared to asymmetric membranes having uniform skins comprised of the same polymers and coated with the same coating materials, the determined separation factor of the multicomponent gas separation membrane being greater than the determined separation factor of the graded density skin asymmetric separation membrane and greater than the determined intrinsic separation factor of the material of the coating and the polymers comprising the graded density skin membrane exhibit a determined intrinsic separation factor greater than the determined intrinsic separation factor of the materials of the coating with respect to the at least one gas of the gaseous mixture;

b. maintaining the opposite surface of the multicomponent membrane at a lower chemical potential for said at least one permeating gas than the chemical potential at the first surface;

c. permeating said at least one permeating gas into and through the multicomponent membrane; and

d. removing from the vicinity of the opposite surface a permeated product having a different proportion of said at least one gas relative to said gaseous mixture.

8. A multicomponent gas separation membrane exhibiting significantly enhanced gas separation permeability while maintaining essentially constant or improved selectivity comprising:

an asymmetric gas separation membrane having a graded density skin and essentially macrovoid-free morphology comprised of glassy, hydrophobic polymers, the graded density skin membrane having increased free volume as evidenced by the membrane first heat T_g which is greater than the T_g of a bulk sample of the glassy, hydrophobic polymers, the graded density skin membrane formed from a dope having a g value of no greater than 2, the polymers of the graded density skin membrane having a separation factor for one gas of a gaseous mixture, which when combined with a coating in occluding contact with the graded density skin membrane provides a multicomponent gas separation membrane which exhibits a selective per-

meability characterized by at least a 50 percent increase for the one gas of the gaseous mixture while maintaining an essentially constant or improved separation factor for the one gas of the gaseous mixture when compared to asymmetric membranes having uniform skins comprised of the same polymers and coated with the same coating materials; the determined separation factor of the multicomponent gas separation membrane being greater than the determined separation factor of the graded density skin asymmetric separation membrane and greater than the determined intrinsic separation factor of the material of the coating and the polymers comprising the graded density skin membrane exhibit a determined intrinsic separation factor greater than the determined intrinsic separation factor of the materials of the coating with respect to at least one pair of gases in the mixture.

4,880,442

POLYIMIDE GAS SEPARATION MEMBRANES

Richard A. Hayes, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

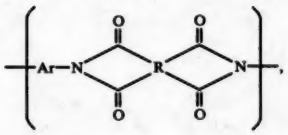
Filed Dec. 22, 1987, Ser. No. 136,846

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

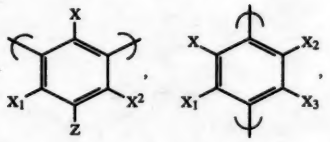
Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **8 Claims**

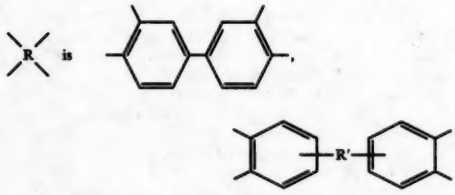
1. A process for separating one or more gases from a mixture of two or more gases comprising bringing said mixture of two or more gases under pressure into contact with one side of an aromatic gas separation membrane consisting essentially of repeating linear units of the formula:



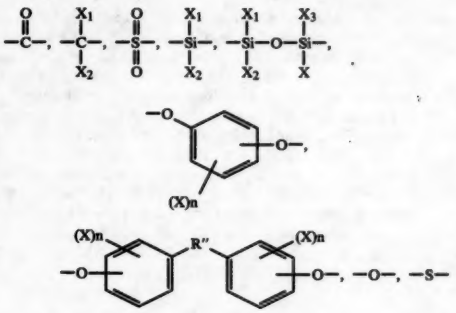
where —Ar— is



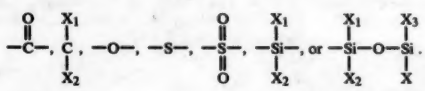
or mixtures thereof,



or mixtures thereof, where —X, —X_1, —X_2, and —X_3 are independently primary or secondary alkyl groups having 1 to 6 carbon atoms, —Z is —H, —X, —X_1, —X_2, or —X_3 and R′ is



or alkylene groups of 1 to 3 carbon atoms, and —R″— is



4,880,443

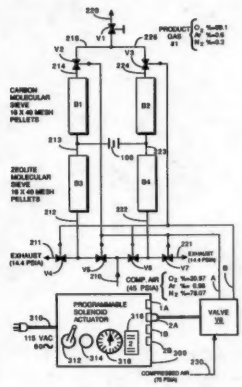
MOLECULAR SIEVE OXYGEN CONCENTRATOR WITH SECONDARY OXYGEN PURIFIER

George W. Miller, and Clarence F. Theis, both of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 22, 1988, Ser. No. 288,315

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 **9 Claims**



1. A process for producing oxygen with a low proportion of argon from a feed gas which is compressed air, using first and second beds containing 16X40 mesh carbon molecular sieve, and third and fourth beds containing 16X40 mesh zeolite molecular sieve, operating by alternately cycling said beds through steps of adsorption and desorption, each cycle having first and second half cycles, comprising:

in each first half-cycle of operation passing said feed gas under pressure through the third and first beds in series to pressurize the beds and provide a flow of product gas at an outlet port to preferentially absorb nitrogen in the third bed and argon in the first bed and concentrate oxygen,

while simultaneously the second and fourth beds are depressurized and the nitrogen and argon absorbed during the previous cycle are desorbed and exhausted;

and in each second half-cycle of operation passing said feed gas under pressure through the fourth and second beds in series to pressurize the beds and provide a flow of product gas at the outlet port to preferentially adsorb nitrogen in the fourth bed and argon in the second bed and concentrate oxygen, while simultaneously the first and third beds are depressurized and the nitrogen and argon adsorbed during the previous cycle are desorbed and exhausted;

whereby by repeating these steps of adsorption and desorption, a continuous stream of oxygen is produced having a purity substantially greater than that of the feed gas (up to 99.1%).

4,880,444

METHOD OF IMPROVING PERFORMANCE OF GAS-LIQUID SEPARATORS

J. George Savins, Dallas, Tex.; Scott G. Hugenberger, San Diego, Calif., and Peggy M. Wilson, Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1985, Ser. No. 815,098

Int. Cl.[4] B01D *17/02, 19/04*

U.S. Cl. 55—36 **18 Claims**

1. A method of enhancing the separation, in a gas-liquid separator means, of a liquid from a mixture comprising a gas and at least one liquid comprising injecting into the mixture at least one additive imparting viscoelastic properties to the liquid, the amount of the additive being effective to cause the mixture to have a Screen Factor of about 3.0 to about 65.0.

4,880,445

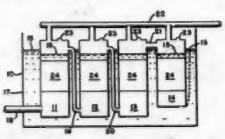
MULTIPLE STAGE GAS ABSORBER

Barnaby J. Watten, 1105 Rustic Ridge Rd., Auburn, Ala. 36830

Filed Jan. 20, 1988, Ser. No. 146,264

Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—68 **17 Claims**



17. A method for absorbing oxygen into water comprising the steps of introducing relatively pure oxygen and relatively pure water into a first compartment; absorbing about 30% of the oxygen into the water; moving the effluent gaseous products of said first absorption to a second compartment; introducing relatively pure water into the second compartment; absorbing about 20% of the original relatively pure oxygen into the water; moving the effluent gaseous products of the second absorption to a third compartment; introducing relatively pure water into the third compartment; absorbing about 10% of the oxygen into the water; moving the effluent gaseous products of the third absorption to a fourth compartment; introducing relatively pure water into the fourth compartment; absorbing about 10% of the oxygen into the water; and recovering the water having the absorbed oxygen.

4,880,446

PROCESS FOR HEATING UP MOIST GASES CONTAINING HYDROGEN HALIDES

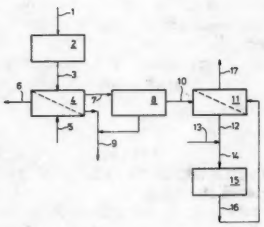
Wolfgang Dietz; Rudolf Gerken; Günter Lailach, and Peter Clasen, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,861

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721056

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—71 **10 Claims**



1. A process for heating up moist gases containing hydrogen halides comprising removing the hydrogen halides from the gases by partial condensation of the water vapor, separating out the condensate and heating up the resultant gases by indirect or recuperative heat exchangers, wherein 5 to 50% of the water vapor is condensed.

4,880,447

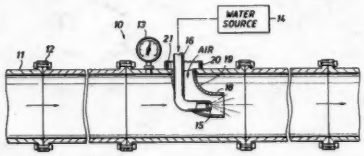
METHOD AND APPARATUS FOR STEAM FLOW VENTING INCORPORATING AIR EDUCTING MEANS

Christopher J. Bloch, Kingwood, Tex., assignor to Naylor Industrial Services, Inc., Pasadena, Tex.

Filed Nov. 22, 1988, Ser. No. 275,229

Int. Cl.[4] B01D *19/00, 47/06*

U.S. Cl. 55—94 **21 Claims**



1. A method of venting a high velocity steam flow wherein the steam flow has sufficient velocity to develop a sonic wave causing steam flow backpressure and creating noise with venting, the method comprising the steps of:

(a) venting a steam flow at a velocity in the range of at least about 35% to a maximum velocity less than sonic velocity through a vent;

(b) spraying a cooling and decelerating fluid into the steam flow upstream of the vent; and

(c) adjusting the rate at which cooling and decelerating fluid sprayed into the steam flow wherein the fluid rate is increased to increase cooling and deceleration while not increasing the fluid such that cooled steam forms droplets collecting upstream of the vent.

4,880,448

DOUBLE FILTER INSERT FOR AN AIR CLEANING APPARATUS

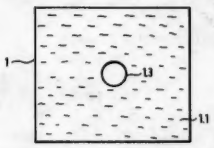
Fernand Scherrer, Isone, Switzerland, assignor to Periso SA Elektro-Industrie, Isone, Switzerland

Filed Mar. 20, 1989, Ser. No. 326,046

Claims priority, application Switzerland, Oct. 25, 1988, 3960/88

Int. Cl.[4] B03C *3/30*

U.S. Cl. 55—103 4 Claims



1. A double filter insert for an air cleaning apparatus having an ionizer, consisting of a pre-filter of polyester in sheet form for retaining coarse dust particles and of a electrostatic filter of nonwoven fabric, also in sheet form, for removing also finest-grain dust particles from the air circulating through the air cleaning apparatus, the filter insert having at least one inspection opening which, for making visible the degree of contamination of the electrostatic filter, is provided in the fabric of the overlying pre-filter, the electrostatic filter in the new condition being of a distinctly brighter color than the pre-filter.

4,880,449

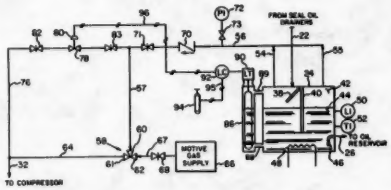
COMPRESSOR SEAL OIL DEGASSING TANK VENT GAS RECOVERY BY METHOD OF LEVEL CONTROL

Mark R. Babyak, North Huntingdon, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Nov. 9, 1988, Ser. No. 269,012

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—170 20 Claims



1. An apparatus for separating a gas, such as a compressor gas, from a liquid, such as a seal oil, comprising

(a) a degassing tank for receiving a mixture of gas and liquid, permitting the gas to separate from the mixture and rise to the top of the tank and permitting the liquid to separate from the mixture and settle to the bottom of the tank;

(b) a vacuum regulator for withdrawing the separated gas from the degassing tank;

(c) means for detecting the level of liquid in the degassing tank; and

(d) control means responsive to the level detecting means for controlling the vacuum regulator and reducing the gas flow therefrom as the fluid level in the degassing tank increases.

4,880,450

CYCLONE SEPARATOR HAVING WATER-STEAM COOLED WALLS

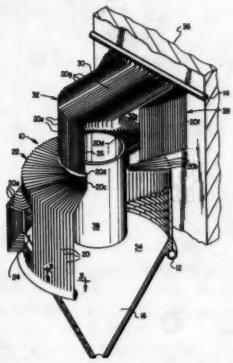
Byram J. Magol, Covent Station; John D. Fay, Randolph, and Michael Garkawe, Madison, all of N.J., assignors to Foster Wheeler Energy Corporation, Clinton, N.J.

Continuation-in-part of Ser. No. 69,930, Jul. 6, 1987, Pat. No. 4,746,337. This application Feb. 29, 1988, Ser. No. 161,632

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—269 6 Claims



1. A cyclone separator comprising an inner cylinder, an outer cylinder extending around said inner cylinder in a coaxial relationship to define an annular chamber between the two cylinders, said outer cylinder comprising a plurality of tubes extending vertically and circumferentially in a parallel relationship for at least a portion of their lengths, a first ring header connected to the upper ends of said tubes and a second ring header connected to the lower ends of said tubes for circulating a cooling fluid through said outer cylinder, means for directing gases containing solid particles through said annular chamber for separating the solid particles form said gases by centrifugal forces, the separated gases exiting through said inner cylinder and the separated solids falling to the bottom of said outer cylinder for disposal or recycle, the upper end portions of said tubes being bent radially inwardly towards said inner cylinder and radially outwardly to form a roof for said annular chamber, and means for passing water or steam or a steam and water mixture through said ring headers and said tubes to cool said outer cylinder.

4,880,451

GAS/LIQUID CONTACTING APPARATUS

Gerrit Konijn, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 10, 1989, Ser. No. 308,488

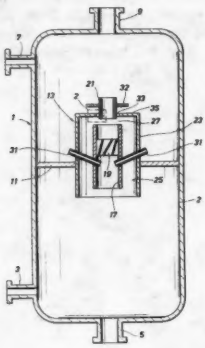
Claims priority, application United Kingdom, Mar. 3, 1988, 8805115

Int. Cl.[4] B01D *45/16*

U.S. Cl. 55—237 10 Claims

1. Gas/liquid contacting apparatus comprising an upright housing provided with a gas inlet, a liquid outlet, a liquid inlet and a gas outlet arranged above the gas inlet, and a horizontal tray arranged between the gas inlet and the liquid inlet and provided with a cyclonic separator extending from below the horizontal tray to above the horizontal tray, which cyclonic separator comprises a vertical swirl tube internally provided with swirl imparting means, a coaxial gas outlet tube disposed near the upper part of the vertical swirl tube, an outer tube disposed around the swirl tube so as to define an annular space

between the swirl tube and the outer tube opening below the tray, a passage communicating between the interior of the swirl tube above the swirl imparting means and the annular space, and at least one conduit extending from the exterior of the cyclonic separator above the tray to the interior of the



swirl tube below the swirl imparting means, wherein the coaxial gas outlet tube is provided externally with an annular deflector, and wherein the outer tube is provided at its upper end with a gas outlet debouching below the annular deflector and with an annular cover of which the inner edge is located around the gas outlet tube below the annular deflector.

4,880,452

METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER CONTAINING FLUORINE IN CLADDING

Hiroo Kanamori; Gotaro Tanaka; Michihisa Kyoto; Naoki Yoshioka, and Futoshi Mizutani, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 47,564, May 11, 1987, abandoned, which is a continuation of Ser. No. 739,668, May 31, 1985, abandoned. This application Dec. 22, 1988, Ser. No. 289,444
Claims priority, application Japan, Jun. 4, 1984, 59-113197
Int. Cl.[4] C03B *37/018, 37/027*
U.S. Cl. 65—3.12 **2 Claims**

1. A method for producing a glass preform for a single mode optical fiber having a cladding containing fluorine, and a core, comprising the steps of:

heating and partially fusing a porous glass rod of pure quartz to such extent that said porous glass rod is not made transparent;

heating said partially fused glass rod in an atmosphere containing fluorine to provide the addition of fluorine only to the outer portion of said porous glass rod so that the inner portion of said porous glass rod remains free of fluorine as pure quartz and to result in said porous rod becoming a substantially transparent fused glass rod;

drawing said fused glass rod, having an inner portion free of fluorine, to a certain diameter;

forming a porous glass layer of pure quartz surrounding the outer surface of said fused glass rod; and

heating said fused glass rod and said porous glass layer in an atmosphere containing fluorine to provide the addition of fluorine to said porous glass layer in an amount equal to the amount of fluorine added to said outer portion of said porous glass rod, and to result in said porous glass layer becoming substantially transparent, whereby a step index optical fiber preform is provided having a uniform amount of fluorine throughout its cladding and having a core free of fluorine.

4,880,453

METHOD FOR MAKING GLASS ARTICLES WITH DEFECT-FREE SURFACES AND SOLUBLE GLASSES THEREFOR

Frank Coppola, Big Flats; William H. Dumbaugh, Jr., Painted Post, and William P. Ryszytiwskyj, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,642
Int. Cl.[4] C03C *19/00*
U.S. Cl. 65—23 **10 Claims**

1. A method for preparing a soda lime glass article having at least one surface which is essentially defect free and is at least equivalent in smoothness to a polished surface which comprises the steps of:

(a) bringing into contact with each other a body of a soda lime glass and a body of a glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 0.75–7.5% Li_2O and/or 18–27% PbO, the total Li_2O+PbO not exceeding 32%, 35–50% BaO, 0–5% Al_2O_3, 30–50% B_2O_3, and 5–10% SiO_2, said glass having a softening point between 575°–650° C., a coefficient of thermal expansion compatible with that of soda lime glass, and being at least 100 times more soluble in a particular solvent than soda lime glass, said contact being at a temperature wherein at least said more soluble glass is in fluid form to produce a laminate having an interface between said glass bodies which is essentially defect free;

(b) cooling said laminate; and then

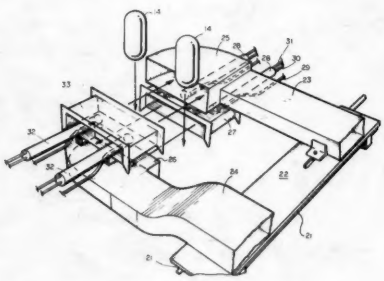
(c) contacting said laminate with an acid solution to dissolve away said more soluble glass whereby said surface of said soda lime glass from which said more soluble glass has been removed is rendered essentially defect free and is at least equivalent in smoothness to a polished surface.

4,880,454

SYSTEM AND METHOD FOR APPLYING LUBRICANT TO CHARGES OF MOLTEN GLASS

Joseph A. Beningo, DuBois, Pa., assignor to O-I Brockway Glass, Inc., Toledo, Ohio

Filed Feb. 2, 1989, Ser. No. 305,058
Int. Cl.[4] C03B *40/02*
U.S. Cl. 65—24 **4 Claims**



1. Apparatus for applying powdered graphite (lubricant) to glass gobs in free fall from a feeder, comprising first and second lubricant spray devices, said spray devices being mounted to a common support member with said devices extending horizontally outward, in parallel, from one side of said support member, said devices being in facing relationship and spaced apart an amount sufficient to permit the passage of a gob of glass therebetween when in operative position, a pair of exhaust headers associated with said spray devices, and mounting means for said support member for moving said support member into and out of position where the spray devices are directed to opposite sides of the free fall path of the gobs without crossing the free fall path of the gobs.

3. In the method of applying powdered mold lubricant to molten glass gobs in free fall from a feeder, wherein flame spray burners with entrained powdered lubricant are positioned to impinge their flames on opposite sides of the gobs, the improvement comprising evacuating the area on the opposite sides of each gob from the burner flame impingement to thereby collect and exhaust any combustion products or powdered lubricant that does not adhere to the gobs.

4,880,455

METHOD FOR THE MANUFACTURE OF SLOW-RELEASE FERTILIZERS

Itzhak Blank, Haifa, Israel, assignor to Haifa Chemicals Limited, Haifa, Israel

Filed Feb. 26, 1988, Ser. No. 160,633

Claims priority, application Israel, Mar. 24, 1987, 81975

Int. Cl.[4] C05C *9/00, 11/00;* C05G *5/00;* C05B *7/00*

U.S. Cl. 71—28 **14 Claims**

1. A method for the manufacture of physically prepared slow-release fertilizers wherein fertilizer particles are coated by at least one layer of a substantially water-insoluble polymer possessing a three-dimensional structure, resulting from the crosslinking at a temperature in the range of 160° C. to 180° C. of a prepolymerized crosslinked unsaturated oil having between 12 to 20 carbon atoms and an iodine value of at least 120, the extent of crosslinking being above 5% gel, wherein catalysts and crosslinking agents are added during the crosslinking polymerization.

4,880,456

CYCLOHEXENONE DERIVATIVES, THEIR PREPARATION AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Dieter Kolassa, Ludwigshafen; Michael Keil, Freinsheim; Ulrich Schirmer, Heidelberg; Hans Theobald, Limburgerhof; Rainer Becker, Bad Duerkheim; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

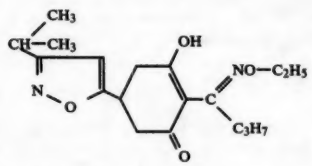
Filed Mar. 16, 1987, Ser. No. 26,378

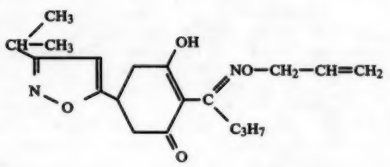
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609181

Int. Cl.[4] C07D *261/08;* A01N *43/80*

U.S. Cl. 71—88 **7 Claims**

1. A compound selected from the group consisting of





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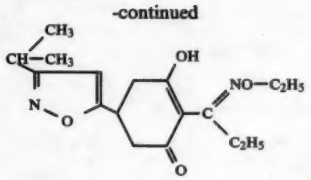
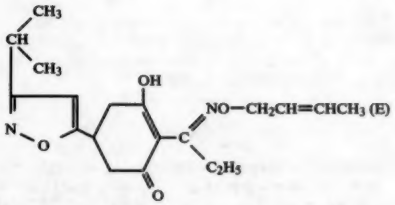
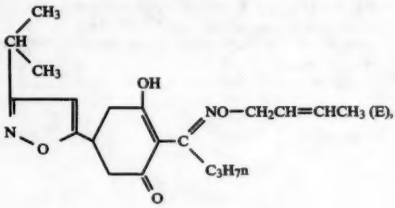
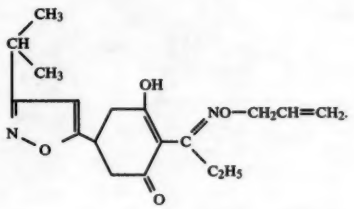






and



4,880,457

ETHERS ON ESTERS OF 1-TRIAZOLE-2-SUBSTITUTED ETHANOLS

Keith P. Parry; Paul A. Worthington, both of Maidenhead, and William G. Rathmell, Wokingham, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, United Kingdom

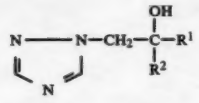
Continuation of Ser. No. 907,180, Sep. 16, 1986, abandoned, which is a continuation of Ser. No. 593,271, Mar. 26, 1984, abandoned, which is a continuation of Ser. No. 293,338, Aug. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 183,410, Sep. 3, 1980, Pat. No. 4,551,469, which is a continuation-in-part of Ser. No. 124,253, Feb. 25, 1980, Pat. No. 4,654,332. This application Mar. 16, 1988, Ser. No. 170,645

Claims priority, application United Kingdom, Mar. 7, 1979, 7908003; Sep. 21, 1979, 7932819; Feb. 15, 1980, 8005141; Aug. 18, 1980, 8026884

Int. Cl.[4] A01N *43/653;* C07D *249/08*

U.S. Cl. 71—92 **12 Claims**

1. A compound of formula (I)



wherein R^1 is C_1–C_6 alkyl, halophenyl, cyclobutyl, cyclopropyl or cyclopentyl and R^2 is halophenyl or halophenyl substituted by C_1–C_6 alkyl or C_1–C_5 alkoxy, in the form of an ether which is a C_{1-6} alkyl ether, a C_{3-4} alkenyl ether or a benzyl ether wherein the benzyl is unsubstituted or substituted with chlorine, or in the form of an ester which is an alkanoyl, alkenoyl or alkynoyl, each of 1 to 4 carbons, or benzoyl or halo- or nitro-substituted benzoyl ester thereof.

4,880,458

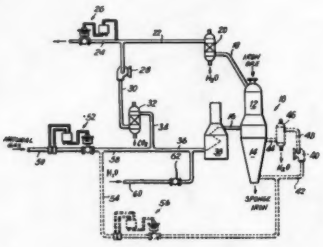
START-UP METHOD FOR A DIRECT REDUCTION PROCESS WITHOUT AN EXTERNAL REFORMER

Enrique R. Martinez-Vera, Monterrey, and Jorge O. Becerra-Novoa, Rinconada Colonial de Apodaca, both of Mexico, assignors to Hylsa, S.A. de C.V., Monterrey, Mexico

Continuation-in-part of Ser. No. 54,420, May 26, 1987, abandoned, which is a continuation of Ser. No. 752,974, Jul. 8, 1985, Pat. No. 4,668,284, which is a continuation of Ser. No. 494,629, May 16, 1983, Pat. No. 4,528,030. This application May 9, 1988, Ser. No. 191,702

Int. Cl.[4] C21B *13/02*

U.S. Cl. 75—35 **20 Claims**



1. A method of start-up of an iron ore reduction moving-bed process, without the use of an external reformer or other external source of H_2 and/or CO, of the type wherein under steady-state conditions a stream of reducing gas comprising hydrogen and carbon monoxide is circulated in a loop comprising within a reactor a reducing zone containing particles of iron ore which are reduced to sponge iron therein, a gas heater, a water removal unit and a carbon dioxide removal unit, and wherein the reducing gas is produced within said reactor by reformation with water of source gas in the form of natural gas or of other hydrocarbons which are gaseous at reforming temperatures, which method comprises:

(a) introducing an at least partial charge of iron ore into said reactor which is essentially devoid of sponge iron and adding additional ore as needed,

(b) introducing source gas into said loop as needed so as to establish and maintain a predetermined operating range of pressure, while also heating the source gas to cracking temperatures in the range of 400° to 500° C., during which a small amount of reducing gas is produced to form a nascent process gas stream circulating in said loop,

(c) thereafter injecting water into said loop for feeding into said reducing zone and in an amount to give a molar water to carbon ratio effective to inhibit carbon deposition before an adverse level of soot can accumulate, while further heating the process gas stream up to a higher temperatures, and initiating removal of carbon dioxide from said process gas circulating in said loop,

(d) interrupting the injection of water after the temperature has risen sufficiently to favor reduction of the iron ore present in the reducing zone by H_2 and CO and after at least an effective threshold amount of H_2 is accumulated in the process gas so as to be available to initiate, in the absence of the H_2O injection, an accumulation of H_2 and CO to a volume effective ultimately to attain steady-state levels, while also further heating the process gas stream as needed up to normal operative reducing temperatures in the range of 800° to 1,000° C. and,

(e) re-initiating the injection of water after sufficient H_2 and CO have accumulated to make up at least a major portion of the process gas, while also adjusting all process feeds including iron ore for steady-state operation.

4,880,459

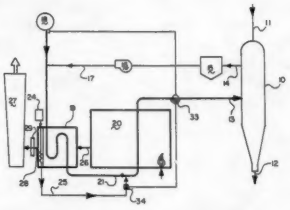
METHOD OF AND APPARATUS FOR REDUCING IRON OXIDE TO METALLIC IRON

Thomas J. Coyne, Jr., Clover, S.C., assignor to T.C., Inc., Clover, S.C.

Filed Jun. 27, 1988, Ser. No. 211,817

Int. Cl.[4] C21B *13/02*

U.S. Cl. 75—35 **10 Claims**



1. A method for the direct reduction of iron oxide to metallic iron comprising: contacting iron oxide material in a furnace with a reducing gas consisting primarily of carbon monoxide and hydrogen; reacting the gas with the iron oxide to form substantially reduced metallic iron and a spent reducing gas consisting substantially of carbon monoxide, H_2O, and small quantities of unreacted reducing gas components; withdrawing the reacted gas from the furnace; cooling and cleaning the withdrawn reacted gas; mixing the cooled clean reacted gas with a gaseous hydrocarbon fuel; heating the gas mixture; reforming the gas mixture to a high percentage of reductants, carbon monoxide, and hydrogen; monitoring the hydrogen to carbon monoxide ratio of the reformed reducing gas and generating a signal thereby; adding steam to the heated reducing gas prior to reforming in response to said signal; and introducing the reformed reducing gas to the direct reduction shaft furnace.

4,880,460

POWDER METALLURGY HIGH SPEED TOOL STEEL ARTICLE AND METHOD OF MANUFACTURE

Edward J. Dulis, Pittsburgh, Pa.; Carl J. Dorsch, North Chili, N.Y., and William Stasko, West Homestead, Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

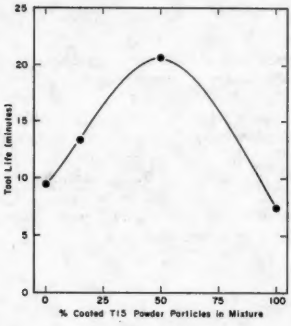
Division of Ser. No. 832,734, Feb. 25, 1986. This application Mar. 4, 1988, Ser. No. 164,018

Int. Cl.[4] C22C *29/02*

U.S. Cl. 75—236 **5 Claims**

1. A powder-metallurgy produced high-speed tool steel article comprising a mixture of coated prealloyed high speed tool steel particles coated with a hard, wear resistant material

and uncoated prealloyed high speed tool steel particles compacted to essentially full density with said hard, wear-resistant



material being at boundaries of said coated particles and contained in a continuous matrix of said high speed tool steel.

4,880,461

SUPER HARD HIGH-SPEED TOOL STEEL

Norimasa Uchida, Yonago, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 897,402, Aug. 18, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 139,161

Claims priority, application Japan, Aug. 18, 1985, 60-181555; Aug. 18, 1985, 60-181556; Aug. 18, 1985, 60-181557

Int. Cl.[4] C22C *29/04*

U.S. Cl. 75—238 **7 Claims**

1. A high-speed tool steel capable of high hardness and toughness, formed by preparing an atomized matrix powder of a high-speed tool steel having a composition which satisfies the condition of $0 \leqq C - Ceq \leqq 0.6$ (where $Ceq = 0.06\ Cr + 0.033\ W + 0.063\ Mo + 0.2\ V$) within the range of $1.7 \leqq C \leqq 4.1\%$, said composition containing 3 to 10% Cr, 1 to 20% W, 1 to 15% Mo (where $18 \leqq W + 2\ Mo \leqq 40$) 1 to 15% V, not greater than 15% Co, not greater than 2% Si, not greater than 1% Mn, and the balance of said matrix being substantially Fe and inevitable impurities; uniformly mixing 88 to 98% of said matrix powder and 2 to 12%, based upon the total, of a powder of one or more hard substances selected from the group consisting of nitrides, carbides and carbonitrides mixture.

4,880,462

RAPIDLY DISSOLVING ADDITIVE FOR MOLTEN METAL METHOD OF MAKING AND METHOD OF USING

Hartmut Meyer-Grünow, Garching/Alz, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

PCT No. PCT/EP87/00387, § 371 Date Mar. 9, 1988, § 102(e) Date Mar. 9, 1988, PCT Pub. No. WO88/00620, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 16, 1987, Ser. No. 194,950

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3624005

Int. Cl.[4] C22C *1/05*

U.S. Cl. 75—253 **22 Claims**

1. Rapidly dissolving additive for molten metal consisting of from 2 to 50% by weight of a component A selected from the group consisting of an alkali metal aluminium tetrafluoride and an alkali metal aluminium tetrafluoridecontaining salt mixture, and 50 to 89% by weight of a component B which consists of at least one alloying metal, the alloying metal being different from the base metal to be alloyed, the components A and B being intimately mixed.

4,880,463

FLUORINE-FREE MOLD POWDERS

Elie E. Saad, Silver Springs, Md., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1989, Ser. No. 307,666

Int. Cl.[4] C21B *5/04*

U.S. Cl. 75—257 **7 Claims**

1. A particulate slagging composition comprising glass network formers and fluxing agents therefor and characterized in the absence of fluorine therefrom said composition comprising in percent by weight:

Li_2O	0.5–9
Na_2O	29–38
CaO	0–25
B_2O_3	5–10
SiO_2	38–50

4,880,464

ELECTROLESS GOLD PLATING SOLUTION

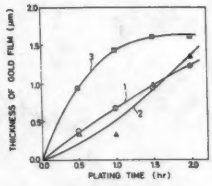
Jiro Ushio, Yokohama; Osamu Miyazawa, Yokosuka; Hitoshi Yokono, Fujisawa, and Akira Tomizawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 918,498, Oct. 14, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 143,959

Claims priority, application Japan, Oct. 14, 1985, 60-226738; Apr. 18, 1986, 61-88269

Int. Cl.[4] C09D *5/10*

U.S. Cl. 106—1.05 **17 Claims**



1. A reducing electroless gold plating solution comprising water, a thiosulfato gold(I) complex, the content of the thiosulfato gold (I) complex being from 0.001 to 0.2 mol/l, a thiosulfate complexing agent capable of being bonded to gold ion in the solution to form a complex, the content of the thiosulfate complexing agent being from 0.001 to 0.5 mol/l, thiourea, the content of the thiourea being 0.001 to 1.0 mol/l, a pH regulator and a stabilizer.

4,880,465

OPAQUE INK COMPOSITION CONTAINING HOLLOW MICROSPHERES FOR USE IN INK JET PRINTING

Adrian Loria, Wilmette, and Josephine Aguilar, Elk Grove Village, both of Ill., assignors to Videojet Systems International, Inc., Elk Grove Village, Ill.

Filed Mar. 9, 1987, Ser. No. 23,196

Int. Cl.[4] C09D *11/02*; C08J *9/32*

U.S. Cl. 106—20 **13 Claims**

1. A nonpigmented ink suitable for use in ink jet printing comprising:

(a) from about 2 to about 20 percent by weight of a resin component;

(b) from about 5 to about 25 percent by weight of hollow microspheres; and

(c) the remainder being a suitable carrier vehicle comprised of water, ammonium hydroxide, and a volatile solvent; all percentages being based upon the total weight of the ink; the hollow microspheres having permeable walls comprised of a synthetic polymeric material, a central void

region filled with water, capable of diffusing through the walls of said microspheres, an inside diameter from about 0.1 to about 0.5 micron and an outside diameter from about 0.4 to about 1 micron; the resin component, the hollow microspheres and the carrier vehicle being chemically nonreactive with each other; and the specific gravity of the ink being about equal to or greater than the specific gravity of the microspheres wherein, the ink has a viscosity at 25 degrees C. from about 3 to about 10 centipoises, an electrical resistivity from about 100 to about 3500 ohm-cm, and a sonic velocity from about 1300 to about 1700 meters/second.

4,880,466

INK FORMULATION FOR MONITORING STERILIZATION PROCESSES

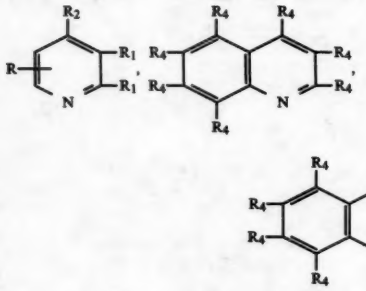
Andrew A. Zwarun, Roslyn Heights, and Gail L. Price, Ridge, both of N.Y., assignors to Edward Weck Incorporated, Princeton, N.J.

Continuation of Ser. No. 945,402, Dec. 22, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 206,948

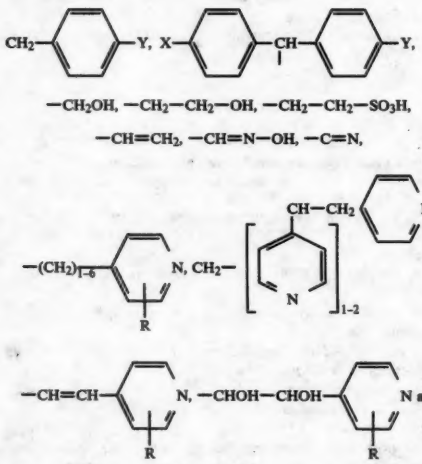
Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—21 **8 Claims**

1. In an ink formulation for monitoring a steam sterilization process, said formulation comprising an active compound selected from the group consisting of



and salts thereof, wherein R_1 and R_2 are independently selected from the group consisting of hydrogen,



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with the proviso that at least one, but not more than two of R_1 and R_2 are hydrogen; R is hydrogen, halogen or alkyl; X is hydrogen, —N=O, —NO_2, —OH, —SH, —CH=N—OH, alkyl or halogen; Y is hydrogen, —N=O, —OH, —SH, —CH=N—OH, alkyl or halogen, Z is oxygen or sulfur; R_3 is —OH, —NH_2, —NH—NH_2 or alkoxy; at least one of the R_4 groups is —OH, —SH or —CH=N—OH, and the other R_4 groups are hydrogen;

the improvement wherein said ink further comprises a nitrocellulose solution and a solvent.

4,880,467

CEMENTITIOUS DOUGH OR PASTE COMPRISING AT LEAST ONE HYDRAULIC ELEMENT AND AT LEAST ONE POLYMER LATEX

Eric A. Rirsch, Billingshurst, and Howard A. Barker, Horsham, both of United Kingdom, assignors to Redland Technology Limited, Surrey, United Kingdom

Filed Oct. 1, 1987, Ser. No. 102,960

Claims priority, application United Kingdom, Oct. 3, 1986, 8623745

Int. Cl.[4] C34B *24/28*

U.S. Cl. 106—85 **19 Claims**

1. An uncured cementitious dough or paste, which is substantially free of particulate components having a diameter greater than 100 microns said paste comprising in admixture:

(a) at least one hydraulic cement;

(b) at least one polymer latex, the polymer being present in an amount of 1 to 20 parts by weight per 100 parts of the cement;

(c) total water in an amount from 8 to 20 parts by weight of water per 100 parts by weight cement; wherein said polymer latex is a member selected from

the group consisting of natural rubber latex and a latex of a synthetic hydrophobic polymer.

4,880,468

WASTE SOLIDIFICATION COMPOSITION AND METHODS

David A. Bowlin, Cortland, and Michael J. Seyman, Warren, both of Ohio, assignors to Halliburton Services, Duncan, Okla.

Filed Sep. 29, 1988, Ser. No. 250,872

Int. Cl.[4] C04B *7/02*

U.S. Cl. 106—98 **5 Claims**

1. A method of solidifying an agglomeration of solid and liquid waste materials resulting from drilling operations comprising:

admixing a waste solidification composition with said agglomeration in an amount of about 100 pounds per 10 to 20 cubic feet of agglomeration, said waste solidification composition consisting essentially of: hydraulic cement present in an amount of from about 60 to 98% by weight of said composition; fly ash present in an amount of rom about 1 to to about 20% by weight of said composition; and fumed silica material present in an amount of form about 1 to about 20% by weight of said composition; and

allowing said admixture of said waste solidification composition and said agglomeration to harden.

4,880,469

PROCESS FOR THE PREPARATION OF A SHAPEABLE SOLUTION OF CELLULOSE IN THE PRESENCE OF A TERTIARY AMINE OXIDE AND AN ADDITIVE

Henri D. Chanzy, La Tronche, and Michel Paillet, Grenoble, both of France, assignors to Institut Textile de France, Boulogne Billancourt Cedex and Centre de Recherche Scientifique, Paris, both of, France

Filed Jun. 27, 1988, Ser. No. 211,575
Claims priority, application France, Jul. 1, 1987, 87 09583
Int. Cl.[4] C08L *1/00*; D01F *9/00*
U.S. Cl. 106—203 5 Claims

1. Process for the preparation of a cellulose solution destined to be extruded or spun, of the type in which is used as solvent for the cellulose a tertiary amine oxide characterized in that ammonium chloride or calcium chloride is added to the mixture of the tertiary amine oxide and cellulose.

4,880,470

AQUEOUS ADDITIVE SYSTEMS, METHODS AND POLYMERIC PARTICLES

Kenneth W. Hyche, and William C. Gose, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 827,042, Feb. 7, 1986, which is a continuation-in-part of Ser. No. 701,888, Feb. 15, 1985, abandoned. This application Sep. 16, 1987, Ser. No. 97,026
Int. Cl.[4] C08L *91/06*
U.S. Cl. 106—271 6 Claims

1. Method of preparing aqueous emulsions which include an emulsifiable wax, a first additive components which has a melting point of 100° C. or less and a second additive component which has a melting point greater than 100° C., said method comprising

(1) mixing, by weight, about 40 to about 65 percent water, about 12 to about 20 percent of said first additive component, about 4 to about 12 percent of said second additive component, about 5 to about 20 percent of an emuldifiable wax, about 0.2 to about 1.0 percent of a base, and about 2 to about 10 percent of a surfactant;

(2) while agitating the mixture, raise temperature of mixture sufficient to melt all solids;

(3) subsequently adding more water at a temperature of at least 85° C. in an amount to yield at least 25% solids;

(4) then reheating the mixture to a temperature sufficient to maintain the solids in a molten state;

(5) maintaining the heated mixture at said temperature and under pressure sufficient to prevent boiling for a period of time to ensure homogeneity;

(6) cooling said emulsion to ambient temperature.

4,880,471

METHOD FOR DETACKIFICATION OF PAINT SPRAY OPERATION WASTES

Herbert J. Kaiser, St. Louis, Mo., assignor to Calgon Corporation, Pittsburgh, Pa.

Division of Ser. No. 77,524, Jul. 24, 1987, Pat. No. 4,759,855. This application Jun. 22, 1988, Ser. No. 209,727
Int. Cl.[4] C09D *1/00*; B08B *7/00*
U.S. Cl. 106—286.6 1 Claim

1. A paint detackifying composition which consists essentially of: 0.1 to 25%, by weight, a zinc salt, 1 to 20%, by weight, ammonium hydroxide, 1 to 10%, by weight, ammonium chloride, and the balance water.

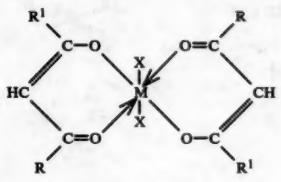
4,880,472

ORGANIC PIGMENTS COATED WITH METAL OXIDES

Philippe Bugnon, Essert; Arnold Grubenmann, Marly; Bernhard Medinger, Giffers, all of Switzerland, and Jean Schaeflé, Mulhouse, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

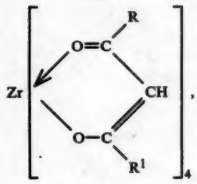
Filed Jun. 6, 1988, Ser. No. 202,865
Claims priority, application Switzerland, Jun. 16, 1987, 2256/87
Int. Cl.[4] C08K *5/00*
U.S. Cl. 106—493 16 Claims

1. A composition containing an organic pigment coated with metal oxides, wherein the pigment particles are provided with a tenacious, dense, highly crosslinked coating of silica and/or alumina which is fixed by polycondensation of a silicate and/or aluminate with the free hydroxyl groups of a layer that densely coats the surface of the pigment particles and which consists substantially of partially hydrolysed compounds of elements of group 4A or 4B of the Periodic Table selected from the group consisting of chelates of formula



(I)

or



(II)

wherein R is methyl, ethyl, methoxy or ethoxy, R^1 is methyl or ethyl and X is halogen or C_1–C_4alkoxy, and M is Ti or Sn, and of esters of formula

$$Q(OR^2)_4 \quad \text{(III)},$$

wherein Q is an element of group 4A or 4B of the Periodic Table and R^2 is C_1–C_4alkyl.

4,880,473

PROCESS FOR THE PRODUCTION OF FERMENTABLE SUGARS FROM BIOMASS

Donald S. Scott, and Jan Piskorz, both of Waterloo, Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Apr. 1, 1988, Ser. No. 176,681
Int. Cl.[4] C13K *1/04*
U.S. Cl. 127—37 8 Claims

1. A process for the production of fermentable sugars from cellulose-containing biomass, the process comprising the steps of:

(a) treating the biomass with a dilute acid capable of dissolving hemicellulose wherein the time and temperature of the treatment and the acid strength are selected so as to obtain a liquid phase containing most of the biomass hemicellulose and a solid phase containing most of the biomass cellulose.

(b) separating the cellulose-containing solid phase from the liquid base,

(c) subjecting the resulting solid phase to rapid pyrolysis at atmospheric pressure and at a temperature in the range 400° C.-600° C. so as to obtain a crude product containing sugars and anhydrosugars, in a reactor where the residence time of pyrolytic vapors is less than about 2 seconds,

(d) adjusting the water content of the crude product to form an aqueous phase containing fermentable carbohydrates and a water-insoluble phase, and

(e) separating the aqueous phase from the water-insoluble phase.

4,880,474

METHOD AND APPARATUS FOR OPERATING VACUUM CLEANER

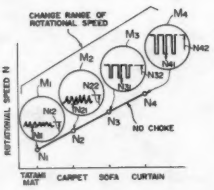
Haruo Koharagi, Ibaraki; Kazuo Tahara, Hitachi; Tsunehiro Endo, Hitachiota; Kunio Miyashita, Hitachi; Yoshitaro Ishii, Hitachi; Fumio Jyoraku, Hitachi; Syuji Watanabe, Ibaraki; Hisanori Toyoshima, Hitachi; Kohichi Saito, Kitaibaraki; Wakichiro Hishi, Nagareyama, and Koujirou Yamashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,598

Claims priority, application Japan, Oct. 8, 1986, 61-237938; Oct. 8, 1986, 61-237942; Oct. 8, 1986, 61-237943; Mar. 6, 1987, 62-50073; Mar. 23, 1987, 62-65608; Mar. 25, 1987, 62-69072; Apr. 3, 1987, 62-80950; Apr. 3, 1987, 62-80951

Int. Cl.[4] B08B *7/00, 7/04*

U.S. Cl. 134—21 **9 Claims**



1. A method of operating a vacuum cleaner having a filter to collect dusts and a variable speed fan motor to give a suction force to a cleaner, comprising the steps of:

sequentially detecting a rotational speed of said fan motor at predetermined intervals during the cleaning;

presuming a cleaning surface or an object to be cleaned from a fluctuation mode based on a change in said detected rotational speed within a predetermined sampling time; and

automatically adjusting an input of the fan motor to set the rotational speed to a speed suitable for said presumed cleaning surface or object to be cleaned whereby the rotational speed of the motor can be automatically operated in the optimum condition in accordance with the cleaning surface or object being cleaned.

4,880,475

METHOD FOR MAKING STABLE OPTICALLY TRANSMISSIVE CONDUCTORS, INCLUDING ELECTRODES FOR ELECTROLUMINESCENT DEVICES

Joseph Lindmayer, Rockville, Md., assignor to Quantex Corporation, Rockville, Md.

Division of Ser. No. 813,929, Dec. 27, 1985, Pat. No. 4,748,375. This application Mar. 14, 1988, Ser. No. 167,348

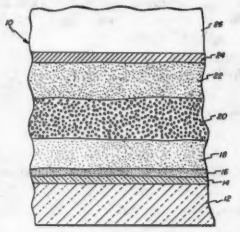
Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—69 **8 Claims**

1. A method of making an optically transmissive electrode structure for an electroluminescent device, said method comprising:

providing an optically transmissive substrate having an optically transmissive electrically conductive layer of indium tin oxide formed thereon; and

electrically stabilizing the indium tin oxide layer by:



coating the indium tin oxide layer with a metal selected from a group consisting of palladium and nickel in a layer less than 100 angstroms in thickness; and

oxidizing the metal layer.

4,880,476

PROCESS FOR THE PHOSPHATE CHEMICAL CONVERSION TREATMENT OF A STEEL MATERIAL

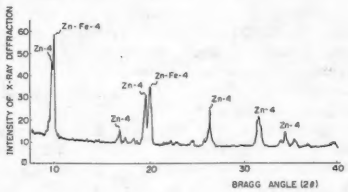
Shigeki Matsuda, Okazaki; Kazuhiko Mori, Hiratsuka; Wataru Gotou, Kariya, and Takahiro Ohnuki, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd. and Nihon Parkerizing Co., Ltd., both of Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,495

Claims priority, application Japan, Dec. 9, 1986, 61-291574; Nov. 30, 1987, 62-300150

Int. Cl.[4] C23C *22/12*

U.S. Cl. 148—253 **13 Claims**



1. A process of phosphate conversion treatment for a steel material comprising bringing a steel material into contact with a phosphate chemical conversion treatment liquid containing mixed anions consisting of phosphate ions and at least one other type of active anions, at least one type of metal ions capable of forming a chemical conversion coating layer, and an oxidizing agent, to provide a phosphate chemical conversion coating layer on the surfaces of the steel material, wherein the temperature of the phosphate chemical conversion treatment liquid is controlled to a level of 40° C. or less without external heating of the liquid, and the composition of the phosphate chemical conversion treatment liquid is controlled in a manner such that the ratio)P/An) of a weight (P) of the phosphate ions to a total weight (An) of the mixed anions therein is ½ or less, the pH thereof is in the range of from 0.5 to 4.5 and the oxidation-reduction potential (hydrogen standard electrode potential) of at least 300 mV wherein, the process as claimed in claim 12, wherein, in the control of the ratio P/An, the pH and the oxidation-reduction potential of the phosphate chemical conversion treatment liquid respectively to a predetermined level.

(A) when the pH of the treatment liquid becomes higher

than a predetermined maximum level, a principal feed including the chemical conversion coating layer-forming metal ions and the active anions is added to the treatment liquid, and when the pH of the treatment liquid becomes lower than a predetermined minimum level, an aqueous alkali solution is added to the treatment liquid;

(B) when the ORP of the treatment liquid becomes higher than a predetermined maximum level, an aqueous solution containing Fe^{2+} ions is added to the treatment liquid, and when the ORP of the treatment liquid becomes lower than a predetermined minimum level, an aqueous solution containing an oxidizing agent is added to the treatment liquid, and

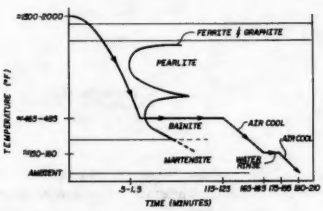
(C) when the electroconductivity (EC) of the treatment liquid becomes lower than a predetermined minimum value, the above-mentioned principal feed is added to the treatment liquid, and when the EC of the treatment liquid becomes higher than a predetermined maximum level, the principal feed is not added to the treatment liquid even if the value of the pH is higher than the predetermined maximum level.

4,880,477

PROCESS OF MAKING AN AUSTEMPERED DUCTILE IRON ARTICLE

William J. Hayes, Shelby; Harry A. Matrone, North Muskegon, and Philip D. Johnson, Whitehall, all of Mich., assignors to Textron, Inc., Providence, R.I.

Filed Jun. 14, 1988, Ser. No. 207,187
Int. Cl.[4] C21D 9/00
U.S. Cl. 148—141 **23 Claims**



1. A process of making an austempered ductile iron article having selected portions thereof hardened and other portions unhardened, comprising:

casting an article from a cast iron composition including, by weight, 3.40% to 3.90% carbon, 1.90% to 2.70% silicon, up to 1.40% manganese, up to 1.5% molybdenum, up to 0.08% phosphorus, up to 2.0% copper and a balance of iron; and

austenitizing the selected portions only of the article in non-austempered condition at a first temperature in a range of 1420° F and 2100° F for a period of one second to 100 seconds;

quenching the article to a second temperature of 450° F to 850° F within 180 seconds;

tempering the article at said second temperature for a period of 10 minutes to 240 minutes; and

cooling the article to ambient temperature,

whereby a layer of austempered ductile iron is formed at the selected portions of the article.

4,880,478

PROTECTIVE COATING FOR STEEL SURFACES AND METHOD OF APPLICATION

Dario A. Emeric, Alexandria; Christopher E. Miller, Burke; Bryan Westich, Woodbridge, and Lisa R. Whiting, Centerville, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1988, Ser. No. 288,357
Int. Cl.[4] C23C 22/13
U.S. Cl. 148—248 **5 Claims**

1. A method for converting corroded steel surfaces to adherent substrates suitable for accepting organic coatings comprising the steps of:

(a) applying a first high-intensity water spray to the surface;

(b) draining excess water from the surface;

(c) applying thereon a first coat of a composition comprising the following ingredients, with their respective volume or weight percentage ranges:

an aliphatic alcohol	2–20% v/v
phosphoric acid	5–15% v/v
an alkali nitrate	0.3–3% w/v
tannic acid	0.1–2% w/v
zinc nitrate	0.3–3% w/v
surface active agent	0.1–1% w/v and
water, softened	balance

wherein % v/v denotes volume percent, e.g. ml per 100 ml of solution, and % w/v denotes weight percent, e.g. grams per 100 ml of solution,

(d) allowing the surface to dry at least 12 hours but not more than 24 hours,

(e) applying a second high-intensity water spray to the surface to remove any unreacted ingredients of said composition,

(f) draining excess water from the surface;

(g) applying thereon a second coat of said composition

(h) allowing the surface to dry at least 12 hours but not more than 24 hours,

(i) rinsing the surface with aqueous alkali bicarbonate solution for sufficient time to remove any unreacted ingredients of said composition,

(j) rinsing the surface with flowing water for sufficient time to completely remove any alkali bicarbonate solution, and

(k) allowing it to dry for at least one hour but not more than 12 hours, thereby forming a adherent substrate for better adhesion of paint.

4,880,479

COLD DRAWN FREE-MACHINING RESULFURIZED AND REPHOSPHORIZED STEEL BARS HAVING CONTROLLED MECHANICAL PROPERTIES AND CONTROLLED MACHINABILITY

Stephen P. Birman, Mayfield Heights; Richard B. Smith, Elyria, and Richard L. Thompson, Amherst, all of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 872,544, Jun. 10, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,308
Int. Cl.[4] C22C 38/60, 38/12
U.S. Cl. 148—320 **13 Claims**

1. A cold drawn resulfurized and rephosphorized free-machining steel bar formed by cold drawing a hot rolled steel bar having the composition, consisting essentially of, by weight:

C up to 0.08%
Mn 0.6% to 1.4%
Si up to 0.1%
P 0.03% to 0.09%
S 0.25% to 0.50%
Cb 0.02% to 0.10%
the sum of Ni, Cr, Mo, and Cu up to 0.15%, and
balance iron.

4,880,480

HIGH STRENGTH HOT ROLLED STEEL SHEET FOR WHEEL RIMS

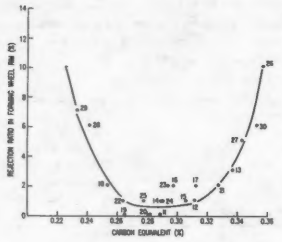
Ichiro Kokubo, Hyogo; Kazuhiko Kourida; Shunichi Hashimoto, both of Kobe; Kazuhiro Mimura, Hyogo, and Zenichi Shibata, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 822,485, Jan. 24, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 87,967

Claims priority, application Japan, Jan. 24, 1985, 60-11198; May 13, 1985, 60-101790; May 13, 1985, 60-101789

Int. Cl.[4] C22C *38/14*

U.S. Cl. 148—320 **3 Claims**



1. A high strength hot rolled steel sheet for wheel rims, consisting of, by weight, from 0.05–0.15% of C, from 0.05–0.5% of Si, from 1.0–1.6% of Mn, from 0.01–0.05% of Al, from 0.005–0.025% of Ti and from 15–60 ppm of N, with the content of P limited to 0.030% or below and the content of S limited to 0.010% or below, the balance being iron and unavoidable impurities, and wherein

the carbon equivalent Ceq=C+Si/24+Mn/6 is in the range of from 0.25–0.34%.

4,880,481

PUNCH AND COUNTER PUNCH PLATES

Werner J. Jerlich; Alfred Kügler, both of Mürzzuschlag; Hans Kaiserfeld, Krieglach; Anton Schulhofer, Langenwang, and Werner Zechner, Kapfenberg, all of Austria, assignors to Böhler Ges.m.b.H., Kapfenberg, Austria

Continuation-in-part of Ser. No. 861,419, May 9, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 167,018

Claims priority, application Austria, May 21, 1985, 1529/85

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.[4] C22C *38/20, 38/40*

U.S. Cl. 148—325 **6 Claims**

1. A punch and counter punch plate fabricated from a chromium containing alloy essential consisting of, each in percent by weight:

carbon	in a maximum of	0.05
silicon	in a maximum of	1.0
manganese	in a maximum of	1.5
chromium	in the range of	11 to 17.5
molybdenum	in a maximum of	1.5
nickel	in the range of	3 to 10
copper	in the range of	1.5 to 4.5
niobium	in the range of	0 to 0.45
titanium	in the range of	0 to 1.5
nitrogen	in a maximum of	0.1,

the remainder being iron and impurities resulting from manufacturing conditions;

said chromium containing alloy having a hardness amounting to at least 45 HRC and at most 54 HRC; and

said chromium containing alloy having a minimum initial stress value of 950 N/mm^2 for initiation of stress corrosion cracking in a humid atmosphere.

4,880,482

HIGHLY CORROSION-RESISTANT AMORPHOUS ALLOY

Koji Hashimoto, 2-25-5 Shogen, Sendai, Miyagi; Kimikado Miura, Ichihara; Katsuhiko Asami, and Asahi Kawashima, both of Sendai, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo and Koji Hashimoto, Sendai, both of, Japan

Filed Apr. 19, 1988, Ser. No. 183,553

Claims priority, application Japan, Apr. 28, 1987, 62-105300

Int. Cl.[4] C22C *30/02*

U.S. Cl. 148—403 **3 Claims**

3. A highly corrosion-resistant amorphous alloy consisting of 15 to 85 at% in the total of at least one element selected from the group consisting of Ti and Zr and at least 1 at% of the sum of Ta and Nb, and the balance being substantially Cu.

4,880,483

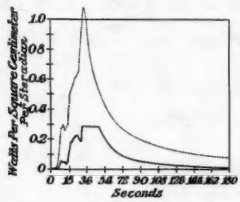
PYROPHORIC COMPOSITION

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 862,712, May 13, 1986, Ser. No. 857,939, Apr. 30, 1986, Ser. No. 849,533, Apr. 8, 1986, Ser. No. 830,767, Feb. 19, 1986, Pat. No. 4,799,979, Ser. No. 685,910, Dec. 27, 1984, Ser. No. 643,781, Jul. 17, 1984, Pat. No. 4,820,362, Ser. No. 559,334, Dec. 8, 1983, abandoned, Ser. No. 507,174, Jun. 23, 1983, Pat. No. 4,694,036, Ser. No. 479,211, Mar. 28, 1983, and Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913. This application Sep. 11, 1987, Ser. No. 96,368

Int. Cl.[4] C06G *45/32*

U.S. Cl. 149—6 **16 Claims**



1. A thermite-type mixture of powdered oxide oxidizer and powdered metal reducer that interact when ignited to generate very large quantities of heat, the mixture being in thermal contact with a truly pyrophoric material which when exposed to air, pyrophorically reacts with oxygen and generates sufficient heat for a sufficiently long time to ignite the thermite-type mixture, the combination being housed out of contact with oxygen.

4,880,484

METHOD FOR MANUFACTURING AND MARKING CABLE

Manfred Obermeier, Eckental, and Erhard Herrmann, Heroldsberg, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 18, 1988, Ser. No. 272,905

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743470

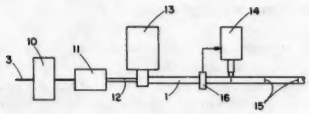
Int. Cl.[4] H01B *13/00, 7/36*

U.S. Cl. 156—51 **11 Claims**

1. Method of manufacturing and marking a cable comprising a core including a plurality of parallel extending electric conductors and/or light wave conductors, comprising the steps of:

drawing a plurality of conductors in a longitudinal direction through a means for affixing a plurality of magnetizable inserts along the length of said conductors, each of said inserts being positioned in association with one of a plurality of particular locations included along said conductors and separated by interposed longitudinal distances;

drawing said plurality of conductors through a means for



applying a protective jacket of insulating material about said conductors and said magnetizable inserts to form a cable; and

drawing said cable through a means for placing markings along the outside of said protective jacket, said marking means including a sensing means that provides control signals as each of said magnetizable inserts moves through said sensing means.

4,880,485

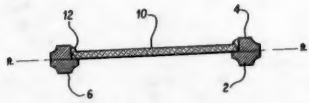
METHOD OF MAKING ORNAMENTAL CASTINGS CONTAINING STAINED GLASS

Thomas H. Lewis, and Suzan K. Lewis, both of 1477 Mullins Station, Memphis, Tenn. 38134

Filed Jul. 27, 1988, Ser. No. 224,737

Int. Cl.[4] E06B *3/54*

U.S. Cl. 156—108 **2 Claims**



1. A method of manufacturing ornamental castings containing stained glass with a pattern plate having drag and cope sides:

A. whereby a double face matchplate is made having a parting line and half of the pattern is on the drag side and half on the cope side;

B. whereby the apertures of the drag side are sufficiently larger than the corresponding apertures of the cope side such that when the casting is poured, a recess is formed around the entire perimeter of the apertures;

C. whereby the recess apertures are one or more;

D. whereby the castings are made of iron, aluminum or other moldable material.

E. whereby the recessed areas are designed to accept inserts;

F. where the inserts are stained glass or other material which allows light to pass.

4,880,486

METHOD FOR MOUNTING ELECTRONIC PARTS

Yukio Maeda, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 11, 1987, Ser. No. 95,183

Claims priority, application Japan, Sep. 12, 1986, 61-216607; Sep. 12, 1986, 61-216608

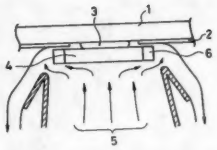
Int. Cl.[4] B32B *31/26, 31/28*

U.S. Cl. 156—273.5 **18 Claims**

1. A method for mounting electronic parts having electrodes, to conductive lands of a printed circuit substrate, at selected positions on said substrate, comprising:

(a) applying to selected positions of a printed circuit substrate having conductive lands, an adhesive which is constituted by a mixture of at least two components one of which renders the adhesive photopolymerizable and the other of which renders the adhesive thermally polymerizable;

(b) irradiating said adhesive on said substrate with ultraviolet radiation and thereby causing said adhesive to gelate and to become a pressure-sensitive adhesive;



(c) loading a plurality of electronic parts having electrodes, onto said pressure-sensitive adhesive at said selected positions, thereby adhering said electronic parts to said substrate at said selected positions, with said electrodes of said electronic parts juxtaposed with said conductive lands of said substrate; and

(d) soldering respective ones of said electrodes to respective ones of said conductive lands.

4,880,487

HOT MELT ADHESIVES CONTAINING POLY(P-HYDROXYSTYRENE) HOMOPOLYMERS AND COPOLYMERS AND BONDING METHODS EMPLOYING SAME

Michael T. Sheehan, and Bakulesh N. Shah, both of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jun. 24, 1988, Ser. No. 210,897

Int. Cl.[4] C09J *5/00*

U.S. Cl. 156—327 **35 Claims**

12. A method of adhering a polyamide article to a surface which comprises providing a hot melt adhesive composition which comprises.

(a) from about 60% to about 98% based on the weight of the composition of a thermoplastic resin selected from the group consisting of an ethylene-vinyl ester copolymer and a polyamide polymer; and

(b) from about 2% to about 40% based on the weight of the composition of a compound selected from the group consisting of poly(p-hydroxystyrene) and copolymers of poly(p-hydroxystyrene) with a C_1 to C_4 alkyl acrylate; heating said composition to a temperature of at least its softening temperature but below its decomposition temperature; and disposing the heated composition between said article and said surface; contacting said article and said surface together with said composition therebetween; and thereafter cooling said composition.

4,880,488

FILM PEELING METHOD AND APPARATUS

Takao Matsuo, Hyogo; Fumio Hamamura, Kanagawa, and Shigeo Sumi, Saitama, all of Japan, assignors to Somar Corporation, Tokyo, Japan

Continuation of Ser. No. 898,162, Aug. 18, 1986, abandoned. This application Oct. 14, 1988, Ser. No. 258,045

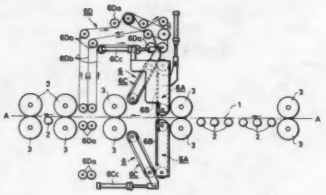
Claims priority, application Japan, Aug. 16, 1985, 60-180842; Aug. 16, 1985, 60-180843; Aug. 16, 1985, 60-180844; Dec. 13, 1985, 60-280796

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—344 **17 Claims**

1. A film peeling apparatus for peeling a film substrate; a film raising means for raising a film from a substrate;

a film peeling guide member arranged substantially perpendicular to said substrate, to set the direction of peeling of said film thus raised to predetermined angle; and



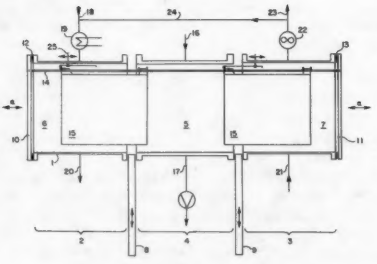
film peeling and conveying means for peeling and conveying said film thus raised by said film raising means, wherein at the beginning of peeling said film, said substrate is conveyed at a speed greater than the speed at which said film is conveyed.

4,880,489

APPARATUS FOR PLASMA ETCHING CIRCUIT BOARDS OR THE LIKE

Richard Ehrenfeldner, Leoben, and Dieter Wagner, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 26, 1986, Ser. No. 900,446
Int. Cl.[4] C23F *1/02*
U.S. Cl. 156—345 **7 Claims**



4. A circuit board plasma etching apparatus comprising:

a preheating chamber for heating a circuit board which is to be etched by a plasma, said chamber being generally tubular and having a predetermined preheating chamber internal diameter between a preheating entry end and a preheating exit end;

a preheating door selectively closing the preheating entry end at least when a circuit board is being heated;

a plasma reaction chamber for plasma etching the circuit board generally axially aligned horizontally with, and receiving heted circuit boards from, said preheating chamber, for etching a received circuit board by a plasma, said chamber being generally tubular and having a predetermined reaction chamber internal diameter approximately equal to the preheating chamber internal diameter between a reaction entry end and a reaction exit end;

preheating sealing means selectively providing a gas-tight seal of the reaction entry end at least when a circuit board is being etched, said preheating sealing means comprising a preheating slide movable transverse of the axis of said reaction chamber selectively to open the reaction entry end when said reaction chamber is receiving the heated circuit boards and to provide a gas-tight seal of said reaction chamber when a circuit board is being etched;

cooling sealing means selectively providing a gas-tight seal of the reaction exit end at least when a circuit board is being etched, said cooling sealing means comprising a cooling slide movable transverse of the axis of said reaction chamber selectively to open the reaction exit end when etched circuit boards are being discharged and to provide a gas-tight seal of said reaction chamber when a circuit board is being etched;

a cooling chamber for cooling the circuit board generally axially aligned with, and receiving etched circuit boards from, said reaction chamber, for cooling etched circuit boards, said chamber being generally tubular and having a predetermined cooling chamber internal diameter approximately equal to the reaction chamber internal diameter between a cooling entry end and a cooling exit end;

a cooling door selectively closing the cooling exit end at least when a circuit board is being cooled;

a preheating gas inlet for furnishing heated gas to said preheating chamber and means for supplying preheated gas to said inlet;

a preheating gas outlet for exhausting gas from said preheating chamber;

a cooling gas inlet for furnishing cool gas to said cooling chamber and means for supplying cooling gas to said inlet;

a cooling gas outlet for exhausting gas from said cooling chamber;

a bypass conduit operatively connected to said cooling chamber and said preheating chamber for furnishing gas exhausted from said cooling chamber to said preheating chamber;

a plurality of circuit board cages for receiving the circuit boards; and

a guide rail extending axially through said reaction chamber and into said preheating chamber and said cooling chamber for guiding said circuit board cages between chambers and supporting said circuit board cages within the chambers, said guide rail being selectively separable into a preheating segment contained within said preheating chamber, a reaction segment contained within said reaction chamber and extending generally axially between said preheating slide and said cooling slide, and a cooling segment contained within said cooling chamber, all provide when said preheating slide and said cooling slide are providing gas-tight seals to the ends of said reaction chamber; said preheating segment being brought into near contingent relation with said reaction segment when one of said circuit board cages is transferred between said preheating chamber and said reaction chamber, and said cooling segment being brought into near contingent relation with said reaction segment when one of said circuit board cages is transferred between said reaction chamber and said cooling chamber.

4,880,490

ADHESIVE BACKED ELEMENT APPLICATOR

B. Stuart MacIntyre, 478 Jean St., Oakland, Calif. 94610

Filed Oct. 13, 1987, Ser. No. 107,669
Int. Cl.[4] B44C *1/00, 7/04, 7/09*
U.S. Cl. 156—541 **10 Claims**

1. Apparatus movable relative to an object and engageable with the surface of said object, said apparatus adapted to serially remove adhesive backed elements from a web and apply an element to said surface responsive to said engagement, said apparatus comprising, in combination:

web supply means;

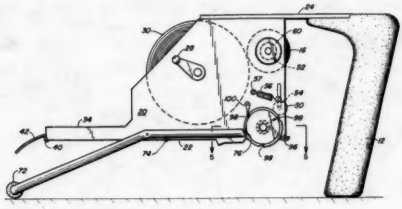
stripper means adapted to strip said adhesive backed elements from said web;

transport means for transporting said web and delivering said adhesive backed elements seriatim from said web supply means to said stripper means, said transport means including a rotatable drive shaft engageable with said

web, said drive shaft including spaced projections disposed about the periphery thereof, said projections adapted to be positioned in perforations formed in said web, and a rotatable take-up spindle for receiving said web after engagement of said web by said drive shaft and for winding up said received web;

actuator means in operative association with said transport means and including a member displaceable from a first position to a second position by said object surface during engagement between said apparatus and surface and during movement of said apparatus relative to said object; and

transmission means interconnecting said actuator means and said transport means, said transmission means being responsive to movement of said actuator means member from said first position to said second position to cause



said transport means to transport said web and deliver an adhesive backed element to said stripper means whereby said stripped element may be applied to said surface by said apparatus during continued movement of said apparatus relative to said object, said actuator means member being adapted to be brought into engagement with an adhesive backed element applied to said surface to press said adhesive backed element against said surface during continued movement of said apparatus relative to said object, said transmission means interconnecting said actuator means member, said drive shaft and said take-up spindle, said transmission means being responsive to displacement of said actuator means member from said first position to said second position to rotate both said drive shaft and said take-up spindle.

4,880,491

GUIDED ROOFING MATERIALS REMOVAL APPARATUS

James L. Jacobs, 2031 A. Denais, Duson, La. 70529, and Larry D. Rogers, 915 S. College, Apt. 50, Lafayette, La. 70503

Filed Aug. 1, 1988, Ser. No. 227,070

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—584 **18 Claims**

1. A roofing material scraper apparatus and guide system, comprising:

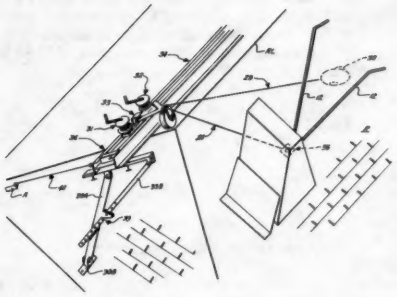
(a) track means for defining a path along a roof ridge line and generally parallel thereto and adapted to be attached at the ridge line of the roof;

(b) a wheeled machine frame that can traverse the roof along travel path lines generally parallel to and spaced from the track means;

(c) stripping means carried by the frame for removing roofing materials such as shingles, felt and/or nails as the frame traverses the roof along the travel path lines;

(d) a movable carriage positioned for travel upon the track;

(e) adjustable support means forming a connection between the carriage and the wheeled machine frame for defining an adjustable support that can vary the distance between the carriage and the wheeled machine frame during movement of the machine frame so that an operator can remove



roofing material from the roof while securing the machine frame and operator on the roof.

4,880,492

ORGANOMETALLIC COMPOUNDS

Dietrich Erdmann, Mühltal; Max E. Van Ghemen; Ludwig Pohl, both of Darmstadt; Herbert Schumann, Berlin; Uwe Hartmann, Berlin; Wilfried Wassermann, Berlin; Meino Heyen, and Holger Jürgensen, both of Aachen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

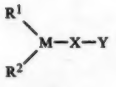
Filed Sep. 15, 1987, Ser. No. 96,583

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631469

Int. Cl.[4] C30B *25/00, 29/40, 29/42;* C23C *16/00*

U.S. Cl. 156—610 **10 Claims**

1. In a process for gas-phase deposition of a metal layer on a substrate, the improvement wherein a source of metal for the deposition process is an organometallic compound of the formula I



I

wherein

M is Al, In or Ga;

X is $-(CHR^5)_n-$ wherein n=2, 3, 4 or 5, -2-C_6H_4—$(CH_2)_m$—, —$(CH_2)_m$-2-C_6H_4—, -2-C_6H_{10}—$(CH_2)_m$—, or —$(CH_2)_m$-2-C_6H_{10}— where m=1 or 2;

R^5 is H or alkyl containing 1–4 carbon atoms;

Y is $-NR^3R^4$ or a 5- or 6-membered heterocyclic ring where the heteroatoms are N atoms; and

R^1, R^2, R^3 and R^4 are each independently H, straight-chain or branched alkyl containing 1–8 carbon atoms, partially or completely fluorinated straight-chain or branched alkyl containing 1–8 carbon atoms, cycloalkyl, alkenyl or cycloalkenyl containing in each case 3–8 carbon atoms, or unsubstituted phenyl or substituted phenyl.

4,880,493

ELECTRONIC-CARRIER-CONTROLLED PHOTOCHEMICAL ETCHING PROCESS IN SEMICONDUCTOR DEVICE FABRICATION

Carol I. H. Ashby, Edgewood; David R. Myers, and Frederick L. Vook, both of Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1988, Ser. No. 207,487
Int. Cl.[4] H01L *21/306;* B44C *1/22*
U.S. Cl. 156—628 14 Claims

1. An electronic-carrier-controlled photochemical etching process for carrying out patterning and selective removing of material in semiconductor device fabrication, said photochemical etching process comprising the steps of:

(a) selective ion implanting for defining a damaged region in the semiconductor material in a desired pattern;

(b) photochemical dry etching the semiconductor material for removing material from non-damaged regions thereof; and

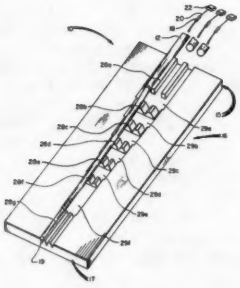
(c) thermal annealing non-removed semiconductor material.

4,880,494

METHOD OF MAKING A FIBER OPTIC ARRAY

Joseph Y. Kaukeinen, Rochester, and Eileen M. Tyo, Livonia, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,758
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—633 8 Claims



1. A method of making a fiber optic array, said method comprising the steps of:

forming a plurality of sets of grooves in a substrate, each set of grooves being separated by an area on said substrate;

inserting the jackets of optical fibers in one set of grooves and fixing the jackets therein;

inserting exposed cladding of said fibers in the remaining sets of grooves and fixing the fibers in said remaining sets of grooves.

4,880,495

REGENERATION OF COPPER ETCH BATH

Kestutis F. Petraitis, Cleveland, and Walter W. Baldauf, Jr., Eastlake, both of Ohio, assignors to The Harshaw Chemical Company, Edison, N.J.

Filed Apr. 13, 1987, Ser. No. 37,477
Int. Cl.[4] C09K *13/06;* C23F *1/00*
U.S. Cl. 156—642 7 Claims

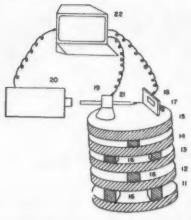
1. In a method of removing copper sulfate from a copper etch bath operated at a temperature of between about 75° F. (23° C.) and 140° F. (60° C.) and composed of hydrogen peroxide and sulfuric acid comprising cooling the etch bath to crystallize out the copper sulfate, the improvement comprising including in the etch bath from between about 0.02% and about 0.2% of a crystallization control agent selected from the group consisting of gum arabic and a low molecular weight glycol having the formula $HOCH_2(CH_2)_XCH_2OH$ wherein X is an integer having a value between 0 and 1.

4,880,496

METHOD AND DEVICE FOR SUBMICRON PRECISION PATTERN GENERATION

Isaiah Nebenzahl, 14 Beruria Street, and Aaron Lewis, 18 Neve Shaanan Street, both of Jerusalem, Israel

Filed Jun. 28, 1988, Ser. No. 212,532
Claims priority, application Israel, Jun. 30, 1987, 83038
Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 15 Claims



10. A method for creating a predetermined pattern on a given substrate, comprising holding the substrate in a manner shielded from vibrations, applying the required energy or chemical material via a tube having a tip of very small predetermined internal dimension, which is metal-coated, moving such tube in a manner as to approach the substrate in a predetermined manner to a desired distance, applying said energy or chemical material via said tip of the tube, thus creating by suitable movement the desired pattern.

4,880,497

PREPARATION OF WATER-SOLUBLE COPOLYMERS CONTAINING VINYLAMINE UNITS, AND THEIR USE AS WET STRENGTH AGENTS AND DRY STRENGTH AGENTS FOR PAPER

Sigberg Pfohl, Speyer; Michael Kroener, Mannheim; Heinrich Hartmann, Limburgerhof, and Walter Denzinger, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 907,222, Sep. 15, 1986, Pat. No. 4,774,288.
This application Apr. 29, 1988, Ser. No. 187,929
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534273
Int. Cl.[4] D21H *1/38*
U.S. Cl. 162—135 8 Claims

1. A process for making paper which has high dry strength and wet strength, comprising applying a hydrolyzed copolymer to a paper sheet, wherein said hydrolyzed copolymer is prepared by a process, comprising:

(i) copolymerizing (a) N-vinylformamide in an amount of from 95 to 10 mole % with (b) an ethylenically unsaturated monomer selected from the group consisting of vinyl acetate, vinyl propionate, the C_1–C_4-alkyl vinyl ethers, N-vinylpyrrolidone, and the esters, nitriles, and amides of acrylic acid and methacrylic acid in an amount of from 5 to 90 mole % to give a copolymer with formyl groups; and

(ii) hydrolyzing from 30 to 100 mole % of said formyl groups of said copolymer to form a hydrolyzed copolymer with amino groups;

wherein said hydrolyzed copolymer is applied to said paper sheet in an amount of from 0.1 to 5% by weight, based on dry fiber.

4,880,498

DRY STRENGTH RESIN OF AMINO/ALDEHYDE ACID COLLOID WITH ACRYLAMIDE POLYMER, PROCESS FOR THE PRODUCTION THEREOF AND PAPER PRODUCED THEREFROM

Sewell T. Moore, and William Brevard, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 892,654, Aug. 4, 1986, Pat. No. 4,845,148.
This application Jan. 13, 1989, Ser. No. 296,560
Int. Cl.[4] D21H *3/38*
U.S. Cl. 162—164.6 10 Claims

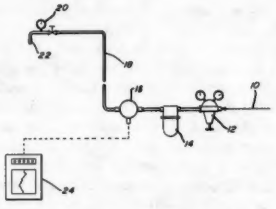
1. A method of producing dry strength in paper which comprises applying to the fibers thereof from about 0.15% to about 5.0%, by weight, based on the weight of the fibers, of an aqueous solution of a copolymer produced by a method which comprises forming an incomplete acid colloid by reacting 1 mole of an acid-soluble, partially condensed, thermosetting, amino-aldehyde resin, in aqueous solution, with from about 0.35 to about 1.5 mole of an acid for from about 15 seconds to about 45 minutes and at a temperature ranging from about 50° C. to about 100° C., reacting (1) a water-soluble or water-dispersible, non-anionic acrylamide polymer with (2) said incompletely formed acid colloid for from about 15 to about 45 minutes at a temperature ranging from about 40° C. to about 100° C., the ratio of (1):(2) ranging from about 4:1 to 1:4, by weight, respectively, and at a total solids content of not more than about 20%, by weight, based on the total weight of the reaction media, to thereby form an aqueous solution of a copolymer of said (1) and (2) formation of said acid colloid continuing in the presence of said added acrylamide polymer during said polymer addition.

4,880,499

METHOD FOR MEASUREMENT OF THE PERMEABILITY TO WATER

Ivan I. Pikulik, Pointe Claire, Canada, assignor to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Filed May 13, 1987, Ser. No. 49,250
Claims priority, application Canada, May 20, 1986, 509566
Int. Cl.[4] D21F *1/32*
U.S. Cl. 162—198 4 Claims



1. A method for the measuring of the water permeability of a pervious sheet material in a paper making machine while said machine is running, wherein the measuring being of the water flow at a specified pressure through a specified nozzle into the sheet material which comprises the steps of:

placing said nozzle against and substantially normal to a single surface of said sheet material while said sheet material is running through said machine,

forcing a flow of water into said running sheet material and through said nozzle at a specified pressure of between 2 kPa and 1,000 kPa,

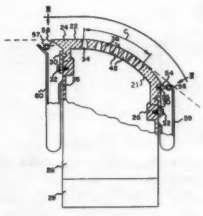
and measuring the water permeability of said sheet material by measuring the rate of flow of the water through said nozzle and into said sheet material while said sheet material is running through said machine.

4,880,500

STATIONARY CERAMIC COUCH DEVICE WITH WATER SPRAY CLEANING NOZZLES

Gerald E. Eldridge, and Gary A. Visseau, both of Thunder Bay, Canada, assignors to Eldridge, Visseau Incorporated, Thunder Bay, Canada

Continuation of Ser. No. 60,158, Jun. 10, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 236,304
Claims priority, application Canada, Jun. 19, 1986, 511990
Int. Cl.[4] D21F *1/52, 1/34*
U.S. Cl. 162—279 6 Claims



1. In the paper forming section of a papermaking machine having a first end, a second end, a porous belt on which a fibrous web is formed at said first end and removing means for removing said fibrous web from said paper forming section at said second end; a couch roll replacement device for dewatering said fibrous web and for changing the direction of travel of said porous belt and said fibrous web, said couch replacement device being located in said paper forming section adjacent to and upstream of said removing means and comprising:

a solid abrasion resistant ceramic element having a continuously convex upper surface in contact with the underside of said porous belt, said convex upper surface thereby changing the direction of travel of said porous belt and said fibrous web, the ceramic element further comprising a lower surface and a plurality of elongated slotted apertures, some of said plurality of elongated slotted apertures terminating directly adjacent the side edges of the ceramic element, said elongated slotted apertures connecting said upper surface with said lower surface;

water spraying means associated with each elongated slotted aperture of said plurality of elongated slotted apertures for spraying water into each of said elongated slotted aperture for dislodging fines collected therein:

said water spray means comprising a plurality of nozzles wherein at least one nozzle is associated with each of said elongated slotted apertures, a header located near an edge of said ceramic element and a plurality of holes in said ceramic element for communicating said header with said plurality of nozzles.

vacuum box means having a single vacuum chamber connected to said ceramic element for providing a uniform high vacuum which acts through all of said plurality of elongated slotted apertures and through said porous belt on said fibrous web to extract water therefrom; and

sealing deckle means located along each side of the ceramic element, said deckle means cooperating with said elongated slotted apertures which terminate directly adjacent the side edges of said ceramic element so as to seal off any portion of said elongated slotted apertures not directly under said fibrous web so as to maintain said uniform high

vacuum within the ceramic element and vacuum box combination so that said high vacuum is applied uniformly through all of said plurality of said elongated slotted apertures to said fibrous web.

4,880,501

PRESS COVER FOR A PRESS FOR DEWATERING WEB MATERIAL

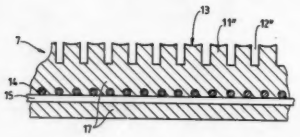
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Fed. Rep. of Germany

Filed Aug. 10, 1988, Ser. No. 230,568

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727563

Int. Cl.[4] B30B *9/20*

U.S. Cl. 162—358 **15 Claims**



1. An elastically deformable press cover for a press for dewatering a web material, the press cover having:

an outside for facing toward the web material, the outside of the cover having ridges defined on it, the ridges being spaced apart by grooves defined in the cover, and the grooves being defined by and between the ridges and facing the outside of the press cover;

the ridges having top ends toward the outside of the cover and having top lands at their top ends; and each ridge top land having opposite edges and being concavely shaped between the opposite edges thereof.

4,880,502

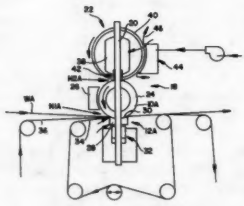
PRESS DRYING APPARATUS WITH DEFLECTION CONTROL AND BLOW BOX COOLING

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Aug. 11, 1987, Ser. No. 84,655

Int. Cl.[4] D21F *3/02*

U.S. Cl. 162—359 **9 Claims**



1. A press drying apparatus for removing excess water from a formed web by the simultaneous application to the web of elevated temperature and pressure for a prolonged period of time, said apparatus comprising:

a frame;

a roll rotatably supported by said frame;

induction heating means for heating said roll;

a pressing shoe connected to said frame, said pressing shoe cooperating with said roll for defining therebetween a first extended nip for the passage therethrough of the web;

a blanket extending through said first nip, said blanket sliding over, and relative to, said shoe such that the web is pressed between said blanket and said roll, the web being in physical contact with said roll;

a single felt extending through said first nip such that said felt is disposed between said blanket and the web; and

a deflection controlling means connected to said frame, said controlling means cooperating with said roll for defining therebetween a second nip, said second nip being disposed diametrically opposite to said first nip such that when the web extends through said first nip and said roll is heated by said heating means, deflection of said heated roll towards said second nip is compensated for by said deflection controlling means and a blow box means disposed in close proximity to said deflection controlling means for blowing a curtain of cooling air against said deflection controlling means to remove heat transmitted to said deflection controlling means through said second nip.

4,880,503

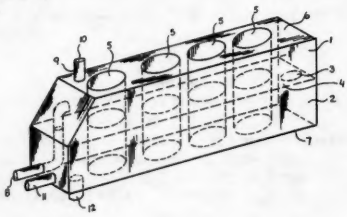
HYDRAULIC RESERVOIR

Joseph Molitorisz, P.O. Box 748, Ames, Iowa 50010

Filed Mar. 3, 1989, Ser. No. 318,763

Int. Cl.[4] F24H *3/00*; F01P *11/08*; F16N *39/02, 7/08*

U.S. Cl. 165—47 **1 Claim**



1. A reservoir for hydraulic fluids in hydraulic systems, said reservoir having a plurality of separate chambers on top of each other, the said chambers being connected to each other by open ports through which the hydraulic fluid is allowed to flow between the said plurality of chambers, the said reservoir having a plurality of substantially vertical thin walled tubings installed between its upper and the lower boundary surfaces, the said thin walled tubings passing through the said plurality of chambers, the said thin walled tubings having both the upper and the lower ends open for free movement of the air through the confinements of the said thin walled tubings, the said thin walled tubings transferring the heat from the hydraulic fluid to the air column within the confinements of the said tubings causing the upward movement of the warm air through the confinements of each of the said plurality of thin walled tubings, the rate of transfer of the heat from the hydraulic fluid to the air column within the confinements of the said thin walled tubings being determined by the temperature differential between the hydraulic fluid and the surrounding atmosphere, thereby providing a self-regulated heat dissipation means from the said reservoir to the surrounding atmosphere, without power driven mechanical components.

4,880,504

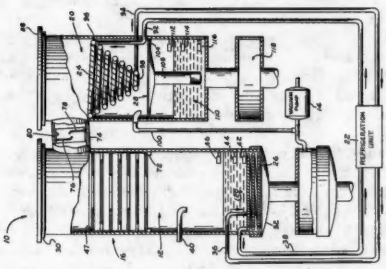
VACUMM DISTILLATION SYSTEM WITH SPIRALLED COLD COIL

John V. Cellini, 274 Belmont Ave.; Mario F. Ronghi, 672 Amostown Rd., and James G. Geren, 46 Irving St., all of West Springfield, Mass. 01089

Division of Ser. No. 18,336, Feb. 24, 1987, Pat. No. 4,770,748. This application Aug. 4, 1988, Ser. No. 228,031

Int. Cl.[4] B01D *3/10, 5/00*

U.S. Cl. 202—185.6 2 Claims



1. A liquid purification system comprising:

a. a vertical separation chamber in which contaminated liquid can be introduced for boiling and evaporation;

b. a vertical product chamber connected in fluid communication with the separation chamber, whereby the distillate vapor can flow from the separation chamber to the product chamber;

c. a hot coil connected to a heat source, wherein the hot coil is located inside the separation chamber, to boil the contaminated liquid;

d. a cold coil connected to a cold source, wherein the cold coil is located inside the product chamber to condense the vapor, said cold coil being spiraled to resemble an upside-down beehive, wherein each coil loop is smaller than the inner diameter of the loop above it to prevent condensate from dripping off an upper loop onto a loop below it and hindering that lower loop's ability to condensate; and

e. an inlet pipe that attaches the spiraled cold coil to the cold source, wherein the inlet pipe is attached to a top loop of the coil and has a vertical extension inside the product chamber to assist in cooling that chamber.

4,880,505

SEPARATION OF M-DIISOPROPYLBENZENE FROM P-DIISOPROPYLBENZENE BY AZEOTROPIC DISTILLATION WITH ESTERS

Lloyd Berg, 1314 South Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Nov. 23, 1988, Ser. No. 275,589

Int. Cl.[4] B01D *3/38;* C07C *7/06*

U.S. Cl. 203—60 9 Claims

1. A method for recovering m-diisopropylbenzene from a mixture of m-diisopropylbenzene and p-diisopropylbenzene which comprises distilling a mixture of m-diisopropylbenzene and p-diisopropylbenzene in a rectification column in the presence of an azeotrope forming agent, recovering the m-diisopropylbenzene and the azeotrope forming agent as overhead product, obtaining the p-diisopropylbenzene from the stillpot, wherein said azeotrope forming agent is an ester which forms a minimum boiling azeotrope with m-diisopropylbenzene, said azeotrope having a volatility relative to p-diisopropylbenzene in the range of 1.20 to 1.29.

4,880,506

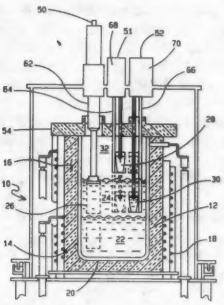
ELECTROREFINING PROCESS AND APPARATUS FOR RECOVERY OF URANIUM AND A MIXTURE OF URANIUM AND PLUTONIUM FROM SPENT FUELS

John P. Ackerman, Downers Grove, and William E. Miller, Naperville, both of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 5, 1987, Ser. No. 117,880

Int. Cl.[4] C25C *3/34*

U.S. Cl. 204—1.5 18 Claims



1. A process for refining spent nuclear fuel containing uranium and plutonium, comprising the steps of:

providing an electrolytic cell having a lower molten cadmium pool containing spent nuclear fuel, an intermediate molten electrolyte pool containing mixed metal chloride salts floating on said lower molten cadmium pool, an anode basket containing spent nuclear fuel, a first and second cathode, said first cathode composed of a solid alloy or molten cadmium and said second cathode composed of molten cadmium, and electrical power means connected to said molten cadmium pool, said anode basket and said cathodes for providing electrical power to the cell,

dissolving additional amounts of uranium and plutonium from said anode basket in said molten cadmium pool,

electrolytically depositing substantially pure uranium on said first cathode, and

subsequently electrolytically depositing a mixture of uranium and plutonium on said second molten cadmium cathode.

4,880,507

TIN, LEAD OR TIN/LEAD ALLOY ELECTROLYTES FOR HIGH SPEED ELECTROPLATING

Michael P. Toben, Smithtown; Neil D. Brown, Merrick; David J. Esterl, Valley Stream, and Robert A. Schetty, Miller Place, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 130,759, Dec. 10, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,851

Int. Cl.[4] C25D *3/32, 3/36, 3/56, 3/60*

U.S. Cl. 204—44.4 31 Claims

1. An electrolyte for depositing tin, lead or tin/lead alloys upon a substrate by high speed electroplating, which comprises:

a basis solution of an alkyl or alkylol sulfonic acid; and at least one of a solution soluble tin compound or a solution soluble lead compound; and

a surfactant of an alkylene oxide condensation compound of an aliphatic hydrocarbon having less than six carbon

atoms and at least one hydroxy group, or solution soluble derivatives thereof.

4,880,508

WATER-SOLUBLE CONDUCTIVE POLYMERS

Mahmoud Aldissi, Sante Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 155,450, Feb. 12, 1988. This application Apr. 3, 1989, Ser. No. 331,776

Int. Cl.[4] C25C *11/00*; H01B *1/06*

U.S. Cl. 204—59 R **11 Claims**

1. A method of making an electrically conductive self-doped polymer having a monomer repeat unit comprised of a thiophene or pyrrole ring, where the monomer-to-monomer bonds of said polymer are located between the carbon atoms adjacent to the sulfur or nitrogen atom, where an alkyl group comprised of from 1 to about 20 carbon atoms is linked to the carbon atom in the number three position of the ring of the monomer repeat unit, where a surfactant molecule is linked to the carbon atom located at the end of the alkyl group, said surfactant molecule being comprised of a sulfonate group or a sulfate group or a carboxylate group, said surfactant molecule further comprising a hydrogen or alkali metal atom linked to said group, where the alkali metal is chosen from a class consisting of lithium, sodium, potassium, rubidium, and cesium, said method comprising:

a. mixing said monomer repeat unit with a compatible solvent;

b. placing spaced-apart compatible conductive electrodes in the resultant mixture of step a;

c. applying a voltage across said electrodes; and

d. recovering an electrically conductive polymer.

4,880,509

ELECTROLYTIC FINISHING METHOD AND APPARATUS

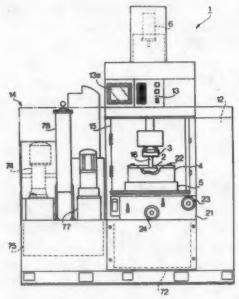
Youhei Kuwabara, Fukuroi; Teruo Asaoka, Kakegawa; Shogo Yoshioka, Iwata, and Haruki Sugiyama, Hamamatsu, all of Japan, assignors to Shizuoka Seiki Co., Ltd., Fukuroi, Japan

Filed Oct. 28, 1988, Ser. No. 264,103

Claims priority, application Japan, Oct. 30, 1987, 62-276920; Jan. 23, 1988, 63-12993

Int. Cl.[4] B23H *3/02, 7/14*

U.S. Cl. 204—129.2 **3 Claims**



1. A method for finishing a work including securing the work in an electrolyte tank, positioning an electrode to form a predetermined gap between the electrode and the surface of the work, supplying electrolyte to the electrolyte tank so as to submerge the electrode and the work, applying electric energy in the form of a pulse to the electrode, supplying clean electrolyte to the tank and draining the electrolyte including residual products, the method comprising:

setting an area of the work to be finished;

setting the electric energy in such a manner that the electric energy per unit area is reduced with increase of the area.

4,880,510

METHOD FOR REMOVING DYE STUFFS FROM WASTEWATER

Kevin D. Uhrich, Amherst, N.Y., assignor to Andco Environmental Processes, Inc., Amherst, N.Y.

Continuation of Ser. No. 156,438, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 63,533, Jun. 18, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,594

Int. Cl.[4] C02F *1/46*

U.S. Cl. 204—131 **7 Claims**

1. A method for electrochemically removing from an ionizing medium contaminants including color impurities and heavy metal ions which are capable of forming an insoluble iron compound or complex comprising the steps of: providing an electrochemical cell comprising a pair of outer electrodes elements which are, respectively, an anode and a cathode positioned in a parallel spaced apart relationship and a plurality of additional electrode elements disposed between said outer electrode elements in a closely spaced relationship therewith, aid additional elements being substantially equidistantly spaced one from another and disposed parallel to said outer electrodes; providing one of said additional electrode elements in neighboring relation to each of said outer electrode elements of sufficient size so as to extend beyond said outer electrode element so as to shield said outer electrode element from flux field effects causing excessive current density; passing an electric current through the ionizing medium containing the contaminants to be removed between said anode, which has a surface or a portion of a surface thereof of iron, iron alloy or insoluble iron compound, and said cathode so as to produce anodically an insoluble iron compound, species or complex in said ionizing medium while cathodically reacting said contaminant ion with the ionizing medium to generate an insoluble hydroxide thereof and whereby an insoluble iron compound or complex with the contaminants is produced, and removing said insoluble iron compound or complex with the contaminants from the ionizing medium.

4,880,511

PROCESS AND APPARATUS FOR RECOVERY OF PRECIOUS METAL COMPOUND

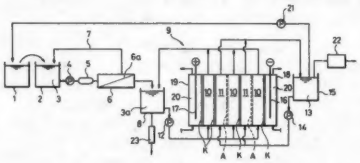
Noriyuki Sugita, Kanagawa, Japan, assignor to Electroplating engineers of Japan, Limited, Tokyo, Japan

Filed May 16, 1987, Ser. No. 50,831

Claims priority, application Japan, May 16, 1986, 61-110865; Jul. 10, 1986, 61-160760

Int. Cl.[4] C02F *1/46, 1/44*; B01D *13/02, 13/00*

U.S. Cl. 204—151 **12 Claims**



1. A process for recovering a precious metal compound, comprising separating a precious metal compound contained in a process liquid by a reverse osmosis membrane, concentrating said separated precious metal compound by electrodialysis employing anion-exchange and cationexchange membranes, and recovering said precious metal compound in a concentrated liquid obtained by said electrodialysis, wherein said process liquid is a concentrated cyanide solution containing a large amount of free cyanide, said concentrated cyanide solu-

tion having been pretreated in a cyanide treating tank comprising an anode chamber and a cathode chamber separated from each other by a cation-exchange membrane so that said concentrated cyanide solution placed in said anode chamber does not make direct contact with said cathode, thereby causing oxidative decomposition of said free cyanide on said anode.

4,880,512

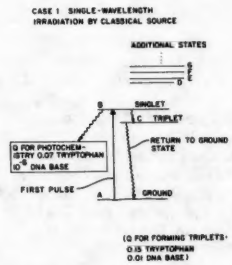
PULSED LIGHT SELECTIVE PHOTOLYSIS PROCESS FOR TREATMENT OF BIOLOGICAL MEDIA AND PRODUCTS MADE THEREBY

Paul A. Cornelius; Robin M. Hochstrasser; Neville R. Kallenbach; Harvey Rubin, all of Philadelphia, Pa., and George J. Todaro, Seattle, Wash., assignors to Kollmorgen Corporation, Simsbury, Conn.

Continuation of Ser. No. 148,113, Jan. 27, 1988, abandoned, which is a continuation of Ser. No. 45,766, Apr. 27, 1987, abandoned, which is a continuation of Ser. No. 690,451, Jan. 14, 1985, abandoned, and a continuation-in-part of Ser. No. 580,848, Feb. 16, 1984, abandoned. This application Oct. 14, 1988, Ser. No. 259,508

Int. Cl.[4] B01J *19/08*

U.S. Cl. 204—157.61 **55 Claims**



1. Process for treating a biological medium to photolyze nucleic acids in preference to proteins present therein, which comprises irradiating said medium with pulsed light of wavelength and flux selected so that (1) the nucleic acids in their ground state absorb radiation and thereby rise to an excited state or states, (2) the nucleic acids in their excited states absorb radiation and thereby rise to higher energy states and undergo photolysis to the extent that nucleic acid activity is reduced by at least 90%, and (3) the proteins in their ground or their excited states do not absorb sufficient radiation to undergo substantial photolysis.

4,880,513

METHOD AND APPARATUS FOR GENERATING ACID AND BASE REGENERANTS AND THE USE THEREOF TO REGENERATE ION-EXCHANGE RESINS

Thomas A. Davis, Annandale, and Donald J. Butterworth, Stirling, both of N.J., assignors to The Graver Company, Union, N.J.

Filed Jun. 20, 1986, Ser. No. 876,911

Int. Cl.[4] B61D *15/06, 13/02*; C02F *13/42*

U.S. Cl. 204—182.4 **73 Claims**

1. A method for generating an acid solution and a base solution by electrodialysis of a salt solution, comprising:

(a) continuously circulating a mineral-containing salt solution through an electrodialysis stack means to produce a partially demineralized salt solution, an acid solution and a base solution;

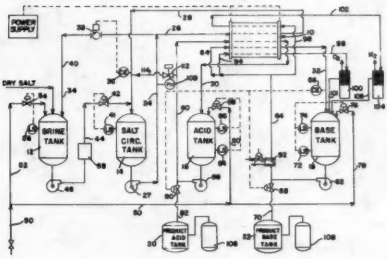
(b) directing the acid solution to an acid receiving tank;

(c) directing the base solution to a base receiving tank;

(d) directing the partially demineralized salt solution from the electrodialysis stack means back through the electrodialysis stack means as the circulating mineral-containing salt solution;

(e) monitoring the salt concentration of the circulating mineral-containing salt solution;

(f) directing a portion of the circulating mineral-containing salt solution through a salt tank containing a saturated salt



solution when the salt concentration of the circulating mineral-containing salt solution drops below a predetermined level; and

(g) directing the solution from the salt tank into the circulating mineral-containing salt solution to increase the salt concentration thereof.

4,880,514

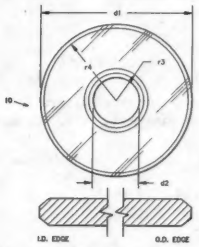
METHOD OF MAKING A THIN FILM MAGNETIC DISK

John C. Scott, Saratoga; Eric K. Li, Palo Alto; Hudson A. Washburn, Santa Clara, and Nal T. Viswanathan, San Jose, all of Calif., assignors to Akshic Memories Corporation, Santa Clara, Calif.

Division of Ser. No. 730,778, May 3, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 85,300

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—192.2 **10 Claims**



1. A method of constructing a thin-film disk recording device comprising:

heating a substrate to a temperature in the range of 190° C. to 350° C.;

sputtering chromium onto said substrate during a first time interval to form a chromium layer on said substrate;

sputtering a magnetic layer comprising cobalt and nickel onto said chromium layer during a second time interval;

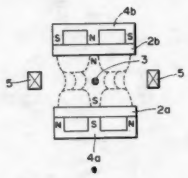
heating said substrate and chromium layer thereon during the time between said first time interval and said second time interval in a vacuum greater than or equal to 5×10^{-7} Torr, to a temperature in the range of 190° C. to 350° C., said time between said first and second time intervals being less than 5 minutes; and

depositing a protective layer over said magnetic layer.

4,880,515
SURFACE TREATMENT METHOD

Masato Yoshikawa, Kodaira; Yukihiro Kusano, Tokorozawa; Kazuo Naito, Kawasaki; Toshio Honda, Akigawa, and Tomonobu Hata, Kanazawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 201,034
Claims priority, application Japan, Jun. 3, 1987, 62-139446
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.12 9 Claims



1. A method for treating the surface of a substrate by magnetron sputtering, comprising the steps of:

placing at least two targets and the substrate to be surface-treated in a sputtering apparatus,

driving atoms out of the target, and

depositing the atoms on the substrate to form a film thereon,

wherein the substrate is placed between the pair of targets which are located in an opposed, spaced-apart relationship whereby atoms driven out of both the targets are deposited on the substrate to form a film thereon, and

at least one magnet is disposed behind each of the pair of targets such that one polarity pole of one magnet faces the opposite polarity pole of the other magnet, the opposed magnets produce lines of magnetic force in a space therebetween, and at least one solenoid coil is disposed outside the magnetic line space and opposed with respect to the substrate, and direct current is supplied to the solenoid coil to form poles which are repulsive to the poles of the opposed magnets behind the targets whereby the component of the lines of magnetic force which extends parallel to the targets is increased to form a dense plasma region above the surfaces of the targets and the targets are eroded and consumed in a dish shape in cross section.

4,880,516
ELECTRO-CHEMICAL MACHINE

Youhei Kuwabara; Teruo Asaoka, and Yasuhiro Iwasaki, all of Shizuoka, Japan, assignors to Shizuoka Seiki Co., Ltd., Shizuoka, Japan

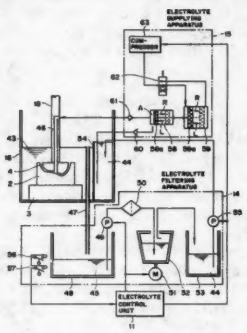
Filed Jun. 13, 1988, Ser. No. 206,482
Claims priority, application Japan, Jun. 23, 1987, 62-156188; Jui. 7, 1987, 62-168947; Oct. 28, 1987, 62-272843
Int. Cl.[4] B23H *3/10, 7/26, 9/12, 7/36*
U.S. Cl. 204—224 M 9 Claims

1. An electro-chemical apparatus, comprising pulse supply means for supplying pulses to a spaced workpiece and electrode arranged in an electrolyte in a working tank so that respective surfaces thereon which conform to each other in shape are facing each other, said pulses effecting finishing of said surface on said workpiece, and eliminating means for eliminating electrolytic products produced in a gap between said workpiece and said electrode,

wherein said eliminating means includes electrolyte filtering means for withdrawing from said working tank and for filtering electrolyte containing electrolytic products;

wherein said eliminating means includes electrolyte supplying means for selectively supplying electrolyte filtered by said electrolyte filtering means to said gap; and

wherein said pulse supply means includes power supply means for supplying at least one pulse to said workpiece and electrode during a first period of time when the flow of electrolyte from said electrolyte supplying means into said gap is stopped, said electrolyte supplying means



thereafter supplying filtered electrolyte to said gap during a second period of time when said pulse supply means has halted pulse generation.

4,880,517
CATALYTIC POLYMER ELECTRODE FOR CATHODIC PROTECTION AND CATHODIC PROTECTION SYSTEM COMPRISING SAME

John E. Bennett, Painesville; Donald S. Novak, Chardon, and Thomas A. Mitchell, Mentor, all of Ohio, assignors to EL-TECH Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 772,443, Sep. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 656,634, Oct. 1, 1984, abandoned. This application Jun. 2, 1987, Ser. No. 57,592
Int. Cl.[4] G23F *13/00*
U.S. Cl. 204—196 4 Claims

1. A cathodic protection system for pre-existing steel-reinforced concrete structures comprising a groove formed in the concrete, a catalytic polymer cable anode for impressed-current cathodic protection positioned in said groove and having a catalyst for operation of the anode at a reduced oxygen potential whereby the polymer of said cable anode is substantially protected from oxidation, a backfill material filling said anode-containing groove and an impressed current power source connected to said cable anode, said cable anode having a metallic core embedded in a non-catalytic, elongated current conducting polymer body forming the anode base, having fixed to the surface of said polymer body from about 10 to about 500 grams of catalytic particles per square meter of polymer body, said catalytic particles comprising mainly a valve metal of the group consisting of titanium, tantalum, niobium, zirconium and alloys and mixtures thereof, said valve metal particles containing catalyst in an amount from 0.1% to 5 0% by weight of valve metal, said catalyst being of precious metal or precious metal oxide selected from the group consisting of ruthenium, palladium, rhodium, iridium, platinum and mixtures thereof, in the metallic state or as an oxide.

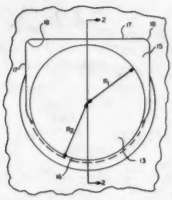
4,880,518
DISK CARRIER

Minoru Akagawa; Satoshi Naoi, both of Fremont, and Heijiro Fukumoto, San Francisco, all of Calif., assignors to Intelmatec Corporation, Fremont, Calif.

Filed Mar. 27, 1989, Ser. No. 329,363
Int. Cl.[4] C23C *14/34;* B05C *11/14*
U.S. Cl. 204—298 9 Claims

1. A disk carrier for supporting a disk at a precisely specifiable position with both surfaces of said disk exposed substantially entirely for processing, said disk carrier comprising

a carrier plate,
at least one generally circular throughhole formed through said disk plate, said throughhole having an inner wall and a diameter slightly less than the diameter of said disk,
a recessed area formed partially around said throughhole, said recessed area abutting at least one half of the circumference of said circular throughhole, and



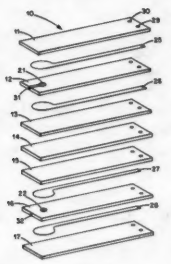
a groove with width substantially equal to the thickness of said disk formed on a distal part of said inner wall of said circular throughhole not abutting said recessed area,
said recessed area having a bottom surface and a boundary wall with at least two mutually adjacent straight sections which form together with said bottom surface a corner serving as a reference position, whereby the three-dimensional coordinates of said corner can be determined by a touch sensor with a pointed contact part.

4,880,519

GAS SENSOR ELEMENT

Da Y. Wang, Lexington; Daniel T. Kennedy, Burlington, both of Mass., and Burton W. MacAllister, Jr., Hudson, N.H., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 24, 1988, Ser. No. 198,029
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—425 **11 Claims**



1. A gas sensor element comprising
a body of solid electrolyte material exhibiting ion conduction in the presence of a gas to be detected;
a first chamber within said body;
passage between said first chamber and the exterior of the body for a gas to be analyzed;
a second chamber within said body spaced from said first chamber with material of said body intervening between said first and second chambers;
passage between said second chamber and the exterior of the body for said gas to be analyzed;
a first set of two electrodes, a tab portion of each facing each other across said first chamber; and
a second set of two electrodes, a tab portion of each facing each other across said second chamber;
so that a voltage applied between said first set of electrodes and said second set of electrodes causes said gas to be detected entering one of said chambers by way of the associated one of said passages to ionize and ions to flow through the solid electrolyte material of the body intervening between the two chambers to the other of said chambers.

4,880,520

HYDROCARBON CONVERSION PROCESS USING TITANIUM-ALUMINUM-PHOSPHORUS-SILICON-OXIDE MOLECULAR SIEVES AS CATALYST

Brent M. T. Lok, New City; Bonita K. Marcus, Rye, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 49,274, May 13, 1987, Pat. No. 4,801,309, which is a division of Ser. No. 600,179, Apr. 13, 1984, Pat. No. 4,684,617. This application Oct. 21, 1988, Ser. No. 260,689
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] C10G *11/04, 47/04*
U.S. Cl. 208—46 **18 Claims**

1. A process for converting a hydrocarbon which comprises contacting said hydrocarbon under hydrocarbon converting conditions with a molecular sieve having a three-dimensional crystalline microporous framework structures of TiO_2, AlO_2, PO_2 and SiO_2 tetrahedral units having an intracrystalline pore system and having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR: (Ti_wAl_xP_ySi_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(Ti_wAl_xP_ySi_z)O_2$ and has a value of zero (0) to about 0.3; and "w", "x", "y" and "z" represent the mole fractions of titanium, aluminum, phosphorus and silicon, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of FIG. 1.

4,880,521

PROCESS FOR THE CRACKING OF FEEDSTOCKS CONTAINING HIGH LEVELS OF NITROGEN

Julius Scherzer, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 47,852, May 7, 1987, Pat. No. 4,810,369. This application Feb. 17, 1989, Ser. No. 312,625
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **29 Claims**

1. A process for the catalytic cracking of a hydrocarbon feedstock containing greater than about 0.25 weight percent total nitrogen, calculated as the element, which comprises contacting said feedstock with a cracking catalyst under cracking conditions in the substantial absence of added molecular hydrogen in a cracking zone to convert components of said feedstock into lower molecular weight constituents, wherein said cracking catalyst comprises greater than about 25 weight percent of a Y zeolite dispersed in a matrix comprising a clay and a synthetic silica-alumina component.

4,880,522

PROCESS FOR HYDROTREATING HYDROCARBON FEEDS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 100,662, Sep. 24, 1987, Pat. No. 4,810,684.
This application Oct. 12, 1988, Ser. No. 256,424
Int. Cl.[4] C10G *45/08*
U.S. Cl. 208—216 PP 110 Claims

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds at a temperature in the range of from about 300° F. to about 900° F. and a pressure in the range of from about 200 psig to about 3500 psig with a hydrotreating catalyst having a surface area of at least about 300 m^2/g, at least about 20% of the pore volume in pores having diameters greater than about 350 Å and at least about 20% of the pore volume in pores having diameters less than about 70 Å, wherein said catalyst is prepared by a process which comprises:

(a) titrating an aqueous solution of one or more aluminum salt(s) with a titrating agent in the presence of a phosphorus-containing compound in an amount of from about 0.06 to about 0.30 moles of phosphorus per mole of aluminum, thereby forming a precipitate,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with salts of an element selected from the group consisting of nickel, cobalt, and mixtures thereof, and salts of a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, at a pH in the range between about 4.0 and about 9.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the salts onto the precipitate is sufficient to yield a final catalyst having from about 1% w to about 5% w cobalt and/or nickel and from about 8% w to about 32% w heavy metal,

(e) partially drying the product of step (d) to reduce loss on ignition to between about 55% and about 65%,

(f) passing the product of step (e) through a mixing means,

(g) extruding the product of step (f), and

(h) drying and calcining the product of step (g) at a temperature ranging from about 300° C. to about 900° C.

4,880,523

PROCESS FOR HYDROTREATING HYDROCARBON FEEDS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 100,663, Sep. 24, 1987, Pat. No. 4,810,686.
This application Oct. 12, 1988, Ser. No. 256,426
Int. Cl.[4] C10G *45/08*
U.S. Cl. 208—216 PP 88 Claims

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds at a temperature in the range of from about 300° F. to about 900° F. and a pressure in the range of from about 200 psig to about 3500 psig with a hydrotreating catalyst having a surface area of at least about 300 m^2/g, at least about 20% of a pore volume in pores having diameters greater than about 350 Å at at least about 20% of the pore volume in pores having diameters less than about 70 Å, wherein said catalyst is prepared by a process which comprises:

(a) titrating an aqueous solution of one or more aluminum salt(s) with a titrating agent for at least about 20 minutes, thereby forming a precipitate,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with salts of an element selected from the group consisting of nickel, cobalt, and mixtures thereof, and salts of a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, and a phosphorus-containing compound in an amount of from about 0.2 to about 1.5 moles of phosphorus per mole of heavy metal at a pH in the range between about 4.0 and about 9.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the salts onto the precipitate sufficient to yield a final catalyst having from about 1%w to about 5%w cobalt and/or nickel and from about 8%w to about 32%w heavy metal,

(e) homogenizing the product of step (d),

(f) extruding the product of step (e), and

(g) drying and calcining the product of step (f) at a temperature ranging from about 300° C. to about 900° C.

4,880,524

PROCESS FOR HYDROTREATING HYDROCARBON FEEDS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 123,510, Nov. 20, 1987, Pat. No. 4,820,679.
This application Dec. 19, 1988, Ser. No. 288,498
Int. Cl.[4] C10G *45/08*
U.S. Cl. 208—216 PP 36 Claims

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds at a temperature in the range of from about 300° F. to about 900° F. and a pressure in the range of from about 200 psig to about 3500 psig with a catalyst having a surface area of at least about 300 m^2/g and at least about 70% of the pore volume in pores having diameters less than about 70 Å, wherein said catalyst is prepared by a process which comprises:

(a) titrating an aqueous solution of one or more aluminum salt(s) with a titrating agent, thereby forming a precipitate,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with salts of nickel and salts of a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, at a pH in the range between about 4.0 and about 10.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the metal salts onto the precipitate is sufficient to yield a final catalyst having from about 1%w to about 6%w nickel and from about 8%w to about 40%w heavy metal,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,880,525

PROCESS FOR HYDROTREATING HYDROCARBON FEEDS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 100,661, Sep. 24, 1987, Pat. No. 4,810,687.
This application Oct. 12, 1988, Ser. No. 256,442
Int. Cl.[4] C10G *45/08*
U.S. Cl. 208—216 PP 88 Claims

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds at a temperature in the range of from about 300° F. to about 900° F. and a pressure in the range of from about 200 psig to about 3500 psig with a hydrotreating catalyst having a surface area of at least about 300 m^2/g, at least about 20% of the pore volume in pores having diameters greater than about 350 Å and at least about 20% of the pore volume in pores having diameters less than about 70 Å, wherein said catalyst is prepared by a process which comprises:

(a) titrating an aqueous solution of one or more aluminum salt(s) with a titrating agent, thereby forming a precipitate,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,
(d) mixing the precipitate with salts of an element selected from the group consisting of nickel, cobalt, and mixtures thereof, and salts of a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, and a phosphorus-containing compound in an amount of from about 0.2 to about 1.5 moles of phosphorus per mole of heavy metal at a pH in the range between about 4.0 and about 9.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the salts onto the precipitate is sufficient to yield a final catalyst having from about 1% w to about 5% w cobalt and/or nickel and from about 8% w to about 32% w heavy metal,
(e) partially drying the product of step (d) to reduce loss on ignition to between about 55% and about 65%,
(f) extruding the product of step (e), and
(g) drying and calcining the product of step (f) at a temperature ranging from about 300° C. to about 900° C.

4,880,526

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 100,659, Sep. 24, 1987, Pat. No. 4,820,680. This application Oct. 12, 1988, Ser. No. 256,425
Int. Cl.[4] C10G *45/04*
U.S. Cl. 208—217 **57 Claims**

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds with a hydrotreating catalyst which has a surface area of at least about 300 m^2/g, at least about 20% of the pore volume in pores having diameters greater than about 350Å and at least about 20% of the pore volume in pores having diameters less than about 70 Å, wherein said catalst is prepared by a process which comprises:
(a) titrating an aqueous solution of one or more aluminum salt(s) with a titrating agent, thereby forming a precipitate,
(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,
(c) washing the precipitate,
(d) mixing the precipitate with salts of an element selected from the group consisting of nickel, cobalt, and mixtures thereof, and salts of a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, at a pH in the range between about 4.0 and about 9.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the salts onto the precipitate is sufficient to yield a final catalyst having from about 1%w to about 5%w cobalt and/or nickel and from about 8%w to about 32%w heavy metal,
(e) partially drying the product of step (d) to reduce loss on ignition to between about 55% and about 65%,
(f) extruding the product of step (e), and
(g) drying and calcining the product of step (f) at a temperature ranging from about 300° C. to about 900° C.

4,880,527

PROCESS FOR REMOVING RESIDUAL MERCURY FROM LIQUID HYDROCARBONS WITH AQUEOUS POLYSULFIDE SOLUTIONS

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1987, Ser. No. 108,598
Int. Cl.[4] C10G *17/04*
U.S. Cl. 208—251 R **7 Claims**

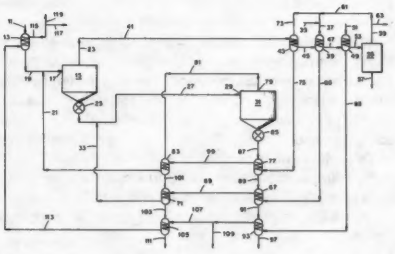
1. A process for treating a liquid hydrocarbon containing mercury comprising:
(a) contacting said liquid hydrocarbon with an aqueous solution of an alkali polysulfide; and
(b) separating a liquid hydrocarbon phase containing a substantially reduced concentration of mercury.

4,880,528

METHOD AND APPARATUS FOR HYDROCARBON RECOVERY FROM TAR SANDS

James D. Westhoff, and Arnold E. Harak, both of Laramie, Wyo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 4, 1988, Ser. No. 188,324
Int. Cl.[4] C10G *1/02*
U.S. Cl. 208—409 **9 Claims**



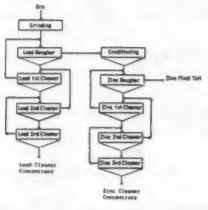
1. A method for utilizing tar sands having a broad range of bitumen content comprising:
rapidly pyrolizing the tar sands in a retort having a cyclone chamber by maintaining the tar sands circulating around the chamber in a fluidized state with hot gases, removing gases from the retort, and removing spent tar sands from the retort;
cooling the gases removed from the retort to remove oil therefrom;
burning the spent tar sands in a burner to generate combustion gases and to heat the spent tar sands to a high temperature sufficient to maintain the ash as granular;
heating at least part of the cooled gases removed from the retort by heat exchange with the combustion gases from the burner, feeding the heated gases removed from the retort back to the retort along with fresh tar sands; and
removing the granular ash from the burner and cooling it.

4,880,529

SEPARATION OF POLYMETALLIC SULPHIDES BY FROTH FLOTATION

Srdjan Bulatovic, and Robert S. Salter, both of Peterborough, Canada, assignors to Falconbridge Limited, Toronto, Canada

Filed May 11, 1988, Ser. No. 192,567
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—167 **18 Claims**



1. A froth flotation process for the enhanced separation of copper bearing sulphides from polymetallic sulphidic minerals

containing copper sulphide and at least one member of the group consisting of: zinc sulphide, sphalerite, nickel sulphide, pentlandite, copper-lead-zinc sulphides and iron sulphides, comprising the steps of:

(a) preparing a froth flotation reagent by first dissolving in water a mixture of quebracho and one member of the group consisting of: dextrin and guar gum, thereafter, adding to the solution so obtained, a water-soluble salt of a lignin sulphonate and so obtaining a second solution, and lastly adding for dissolution to said second solution at least one member of the group consisting of: alkali metal cyanide, alkaline earth metal cyanide, water-soluble metal sulphate, and a water soluble sulphite containing a tetravalent sulphur atom, so yielding, as the reaction product, a froth flotation reagent solution containing said ingredients added in three successive dissolution steps;

(b) adding said froth flotation reagent solution to an aqueous slurry comprising ground polymetallic sulphicid minerals containing copper sulphide and at least one member of the group consisting of: zinc sulphide, sphalerite, nickel sulphide, pentlandite, copper-lead-zinc sulphides and iron sulphides, and conditioning agents, in an amount sufficient to float the copper sulphides; and

(c) subjecting said aqueous slurry to froth flotation to yield a copper sulphide bearing froth and a tailing containing polymetallic sulphidic materials depleted in copper sulphides.

4,880,530

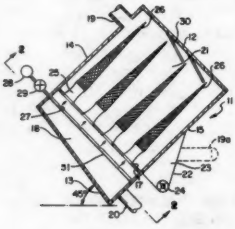
SELF-CLEANING SCREENING DEVICE

Robert E. Frey, 2 Highland Ave., Chatham, N.J. 07928

Continuation-in-part of Ser. No. 129,230, Dec. 7, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 214,765

Int. Cl.[4] B07B *1/55*

U.S. Cl. 209—380 **18 Claims**



1. An apparatus for continuously separating a mixture of fine and coarse particles comprising:

(a) a hollow housing having a tubesheet located therein tilted downwardly at an acute angle from the horizontal, said tubesheet separating said housing into a lower fines outlet chamber and an upper pre-screen chamber;

(b) a plurality of Venturi tubes mounted on said tubesheet;

(c) a plurality of screen elements mounted on said Venturi tubes;

(d) means located in said fines outlet chamber for introducing a pulse of a compressed gas through said Venturi tubes to the screens;

(e) an inlet for introducing air and said mixture of fine and coarse particles to said pre-screen chamber mounted in said housing;

(f) an outlet for coarse particles mounted on said housing and communicating with said pre-screen chamber; and

(g) an outlet for fine particles mounted in said housing and communicating with said fines outlet chamber.

4,880,531

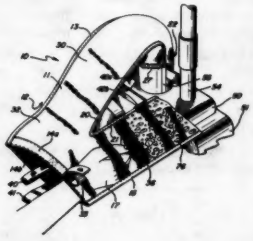
POOL VACUUM FILTER BAG

Scott L. Blake, Anaheim; Millie A. Carthew, Westminster, and Christopher G. Collins, Garden Grove, all of Calif., assignors to Christopher G. Collins, Garden Grove, Calif.

Filed Mar. 2, 1988, Ser. No. 163,329

Int. Cl.[4] B01D *35/16*

U.S. Cl. 210—169 **17 Claims**



1. For use in filtering the discharge flow of a submersible pool vacuum having a vacuum unit for drawing pool water and debris from the submerged pool surfaces, a discharge port for discharging a flow of pool water and vacuumed debris, and a water supply hose; a pool vacuum filter bag comprising:

an upper chamber formed of a mesh material and defining a separable top seam and closed side seams;

an enlogated flow chamber formed of a mesh material and having a first opening coupled to said upper chamber, a mouth portion coupleable to said discharge port, and an elongated flow passage therebetween, said flow chamber operative to receive said flow of pool water and debris and couple it to said upper chamber;

an elongated closed-end debris chamber formed of a mesh material separable from said flow chamber and coupled to said upper chamber and extending downwardly therefrom;

chamber attachment means for releaseably attaching said debris chamber to said flow chamber; and

flow directing means within said upper chamber for directing said flow of pool water and debris laterally within said upper chamber,

said debris chamber being constructed to be turned inside-out and to be drawn outwardly through said separable top seam of said upper chamber when separated while said mouth portion remains coupled to said discharge port.

4,880,532

SORTING APPARATUS FOR FIBER SUSPENSIONS

Albrecht Meinecke, and Walter Musselmann, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 15,214

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605078

Int. Cl.[4] D21D *5/06*

U.S. Cl. 209—268 **28 Claims**

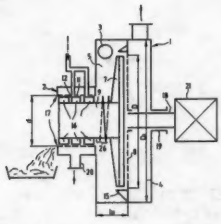
1. A final stage sorter of a sorting apparatus for sorting a heavily contaminated rejects fraction from waste paper fiber suspension, said final stage sorter comprising:

a substantially rotationally symmetric casing having a first rotationally symmetric casing section and a second rotationally symmetric casing section communicating with one another, said second casing section having an open end opposite said first casing section, the diameter of said first casing section being larger than the diameter of said second casing section, said first and second casing sections having a common axis of rotational symmetry;

a flat strainer mounted in said first casing section substan-

tially perpendicular to said axis, said flat strainer together with said first casing section defining a first accepts space and a churning space within said first casing section, said first casing section having inlet means for communicating said fiber suspension to the churning space;

a strainer basket mounted concentrically within said second casing section, said strainer basket together with said second casing section defining a sorting space and a second accepts space, the sorting space of said second casing



section being adjacent to and in communication with the churning space of said first casing section; and

a rotor mounted in said casing and rotatable about said axis, said rotor including an impeller disposed in said first casing section and rotatable in said churning space in proximity to said flat strainer, said rotor including a cylindrical component having circumferentially disposed sorting elements disposed in said second casing section and rotatable in proximity to said strainer basket.

4,880,533

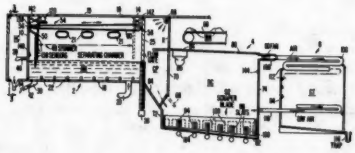
APPARATUS AND SYSTEM FOR TREATING WASTE WATER AND SLUDGE

John Hondulas, Rte. 4, Box 505, Gatlinburg, Tenn. 37738

Filed Jun. 9, 1988, Ser. No. 204,533

Int. Cl.[4] B01D *17/035;* **C02F** *1/40*

U.S. Cl. 210—104 **44 Claims**



1. An apparatus for treating waste water including oil and grease, comprising:

a separating tank defining a separating chamber for receiving a quantity of waste water; and

a flow gate positioned at a side of said separating chamber, said flow gate being movably disposed so that it can be lowered for separating a floating component of the waste water from the remaining water relatively free of the floating component by removal of the floating component from said separating chamber,

and a drying means forming a drying chamber operatively connected to said separating chamber.

4,880,534

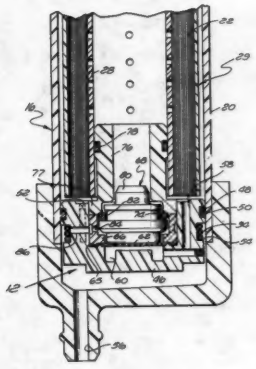
REVERSE OSMOSIS WATER PURIFICATION SYSTEM WITH IMPROVED PRESSURE RELIEF VALVE

Bruce D. Burrows, 25581 Via Paladar, Valencia, Calif. 91355

Filed Sep. 26, 1988, Ser. No. 249,518

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—130 **12 Claims**



1. A reverse osmosis water purification system, comprising:

a reverse osmosis module for receiving a feed water supply and for producing therefrom a supply of relatively purified water and a supply of relatively impure reject water;

a storage reservoir having a pure water chamber for receiving and storing purified water, said storage reservoir including means for pressurizing the purified water therein to a pressure level directly proportional to the quantity of purified water within said reservoir;

means for coupling the purified water from said reverse osmosis module to said storage reservoir;

faucet valve means coupled to said storage reservoir for dispensing purified water from said storage reservoir;

drain means for coupling the reject water from said reverse osmosis module to a drain, said drain means including a restrictor for flow of the object water with substantial pressure drop from said reverse osmosis module to the drain; and

a pressure relief valve for limiting the pressure of the purified water within said storage reservoir to a predetermined proportion of the pressure of the reject water generally at an upstream end of said restrictor, said pressure relief valve including a valve body defining a relief port, and a valve head with first and second differential surface areas exposed respectively to the pressure of the reject water generally at the upstream end of said restrictor and to the pressure of the purified water, said valve head being movable in response to the pressures applied to said differential surface areas between closed and open positions respectively closing and opening said relief port, said relief port when opened permitting bleed flow of purified water to the drain to limit the pressure of the purified water;

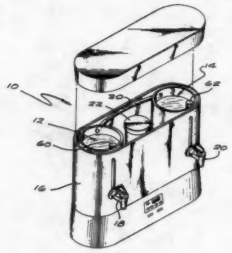
said relief valve including means carried by said valve body to isolate said valve head from direct contact with reject water.

4,880,535

WATER SUPPLY STATION WITH MULTIPLE WATER STORAGE RESERVOIRS

Bruce D. Burrows, 25581 Via Paladar, Valencia, Calif. 91355

Filed Feb. 21, 1989, Ser. No. 312,760
Int. Cl.[4] B01D *36/00*
U.S. Cl. 210—181 **15 Claims**



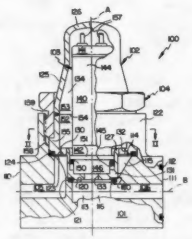
1. A water supply station, comprising:
a first reservoir for receiving water from a feed water supply;
a second reservoir;
an overflow conduit coupled between said first and second reservoirs such that water within said first reservoir spills through said overflow conduit when said first reservoir reaches a substantially filled condition to flow into and fill said second reservoir;
dispensing valve means for separately dispensing water from said first and second reservoirs; and
temperature control means for maintaining water within said first and second reservoirs at different temperature levels, said temperature control means including a cooler assembly associated with one of said first and second reservoirs for reducing the temperature of the water therein.

4,880,536

FILTER ASSEMBLY OF A MANIFOLD, MOUNTING RING AND FILTER HOUSING

Garry R. Haraveth, Cortland; Robert J. Catterfeld, Homer, both of N.Y., and Benjamin Trasen, Littleton, Colo., assignors to Pall Corporation, Glen Cove, N.Y.

Filed May 15, 1987, Ser. No. 50,013
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—232 **20 Claims**



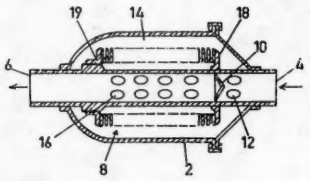
1. A filter assembly comprising a manifold including first and second ports; a filter housing including a side wall and an end wall having first and second spaced openings and a cylindrical protrusion containing a bore; a hollow, generally cylindrical filter element disposed within the filter housing spaced from the side wall and including an end cap which has an opening communicating with the interior of the hollow filter element and is disposed in the bore of the filter housing, the first opening of the filter housing communicating with the space between the side wall and the filter element and the second opening of the filter housing communicating with the opening in the end cap; and a mounting ring operatively associated with the filter housing and the manifold for detachably mounting the filter housing to the manifold with the first and second ports of the manifold respectively communicating with the first and second openings of the filter housing.

4,880,537

MULTIPLE DISC TYPE FILTER AND DISC CONSTRUCTION USEFUL THEREIN

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Continuation of Ser. No. 850,146, Apr. 10, 1986, Pat. No. 4,744,901. This application Mar. 14, 1988, Ser. No. 167,999
Claims priority, application Israel, Apr. 10, 1985, 74873
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] B01D *25/02*
U.S. Cl. 210—323.1 **17 Claims**



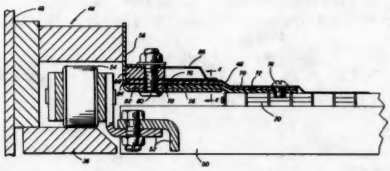
1. A filter including a housing having an inlet connectable to an upstream pipe, and an outlet connectable to a downstream pipe; and a stack of discs disposed within said housing for separating solid particles from a fluid flowing between said discs from the upstream side of said stack to the downstream side thereof; characterized in that said stack includes:
a plurality of cooperating filter elements defining a plurality of paired co-operating filter surfaces, including a first surface defining a large surface area and a second surface contacting only a portion of said large surface area of said first surface and leaving a portion of the large surface area on the upstream side of the stack not contacted thereby, at least one of said first and second surfaces being formed with grooves at the areas at which said first and second surfaces contact, thereby to form means enabling use of the filter in high pressure or corrosive environments including:
(a) compartments on the upstream side of the stack for accumulation of solid particles; and
(b) edge filtering passageways extending along the grooves in contact with said second surface, which passageways define the minimum size of particles separated by the filter and extend from said compartments to the downstream side of the stack, and wherein said second surface is formed with serrated edge surfaces defining said compartments on the upstream side of the stack, thereby increasing the length along which edge filtering passageways are defined.

4,880,538

EDGE SEAL FOR LIQUID FILTRATION APPARATUS

Lyle B. Barcomb, North Syracuse, and Lawrence El-Hindi, Fabius, both of N.Y., assignors to Filter Tech Inc., Manlius, N.Y.

Filed Aug. 15, 1988, Ser. No. 231,963
Int. Cl.[4] B01D *33/12*
U.S. Cl. 210—401 16 Claims



1. In a liquid filtration apparatus having a tank for receiving liquid carrying solid contaminants and having parallel side walls, a continuous conveyor having an upper reach carrying a liquid-permeable media having lateral edges, said upper reach being positioned within and movable through the liquid in said tank, and a chamber below said tank and communicating therewith through an opening to receive filtered liquid passing through said media and said opening, edge seal means providing an essentially fluid-tight seal along each lateral edge of said upper reach to prevent leakage of unfiltered liquid from said tank through said opening and into said chamber, said edge seal means comprising:

(a) a pair of substantially flat, superposed, upper and lower strips of fluid-impervious material fixedly attached to the interior of said tank on both sides thereof and extending inwardly, substantially parallel to and spaced from one another, said strips each having first and second terminal ends positioned above the level of liquid in said tank adjacent the positions at which said upper reach enters and exits, respectively, said liquid;

(b) a rigid seal support fixedly attached to the interior of said tank on both sides thereof and extending inwardly with an upper surface parallel to and underlying said lower strip;

(c) a layer of fluid-impervious material affixed to each lateral edge of said conveyor about the entire periphery of said conveyor for movement therewith;

(d) the outermost portions of each lateral edge of said media being positioned between opposing surfaces of said upper and lower strips on both sides of said tank for sliding movement between said first and second terminal ends thereof; and

(e) the outermost portions of the lateral edges of said layer affixed to each of said conveyor lateral edges being positioned between opposing surfaces of said lower strip and said seal support on both sides of said tank for sliding movement between said first and second ends thereof.

4,880,539

FILTER FOR FILTERING SOLIDS OUT OF A LIQUID HAVING A DOCTOR BLADE WIPING MEANS

John E. Crawford, Glens Falls, and Keith Crofut, Fortedward, both of N.Y., assignors to Cellier Corporation, South Natick, Mass.

Filed Oct. 16, 1987, Ser. No. 109,431
Int. Cl.[4] B01D *33/36, 35/16, 35/28;* B07B *1/52*
U.S. Cl. 210—408 17 Claims

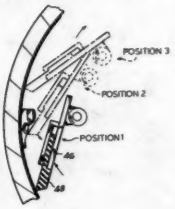
1. A filter for filtering solids out of a liquid comprising:

a housing for receiving a liquid;

a cylindrical filter member having a filter surface positioned in said housing for screening oversized solids from a liquid passing through the filter surface which are deposited on the filter surface;

doctor blade means engaging the filter surface and accumulating solids deposited on said surface through the relative rotation therebetween;

said doctor blade means including a blade member biased into engagement with said filter surface at an acute angle relative to the direction of movement as between the filter member and the blade means; and



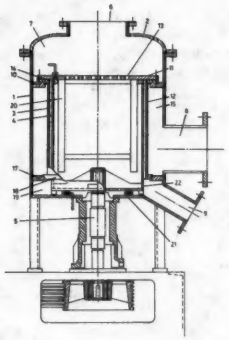
blade wiping means including a portion spaced at a distance from the filter surface and disposed in the path of travel of said blade member for cleaning the accumulated solids from members at least once each time the blade member travels the circumference of the filter member.

4,880,540

PULP SCREENING APPARATUS

Frey Frejborg, Glens Falls, N.Y., assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Continuation-in-part of Ser. No. 738,743, May 29, 1985, Pat. No. 4,676,903, which is a continuation-in-part of Ser. No. 472,742, Mar. 7, 1983, Pat. No. 4,529,520. This application Jun. 11, 1987, Ser. No. 61,594
Claims priority, application Finland, Jan. 26, 1983, 830256
Int. Cl.[4] B01D *29/38;* B07B *1/20*
U.S. Cl. 210—413 27 Claims

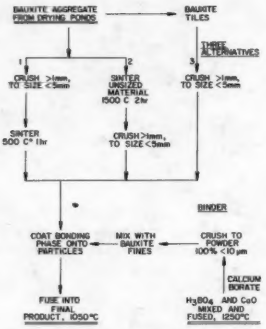


1. A pulp screening apparatus comprising a housing having an inlet for allowing fibrous stock to be introduced into the interior thereof, a first outlet for allowing the accept screened stock to be removed therefrom, a second outlet for the reject, a screen cylinder having a contour surface with grooves within said housing, a rotor moving in the vicinity of said screen at a predetermined speed and forming together with said screen an annular screening chamber, said rotor being located in the inlet side of the screen and wherein at least the surface facing the screen is at least partially contoured with grooves and is provided with a plurality of openings or perforations along at least a portion of the length of said screening chamber to allow fibrous stock to be introduced into said screening chamber and prevent the undesired debris of the stock from entering said chamber.

4,880,541
HOT FILTER MEDIA

Paul J. Chiron, Victoria; Kevin D. Watson, South Australia, and Raymond W. Shaw, Victoria, all of Australia, assignors to Comalco Aluminum Limited, Melbourne, Australia

Filed Mar. 24, 1988, Ser. No. 172,441
Claims priority, application Australia, Apr. 3, 1987, PI1243
Int. Cl.[4] B01D *39/14;* B05D *5/00*
U.S. Cl. 210—496 19 Claims

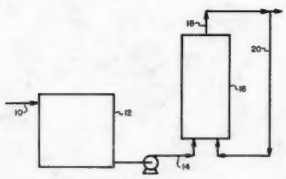


1. A filter medium suitable for removing entrained solids from fluids at high temperatures characterized in that said medium comprises sintered ultrafine bauxite particles having an average size between 0.1 microns and 1.0 millimeter.

4,880,542
BIOFILTER FOR THE TREATMENT OF SOUR WATER

Kerry L. Sublette, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 13, 1988, Ser. No. 193,712
Int. Cl.[4] C02F *3/34*
U.S. Cl. 210—611 5 Claims



1. A process for oxidizing the inorganic sulfide in a water stream to form the corresponding sulfate comprising the steps of:

(a) providing a sulfide tolerant strain of *T. denitrificans* tolerant of levels of sulfide in excess of 1000 µM;

(b) immobilizing said strain together with calcium carbonate on or within a carrier;

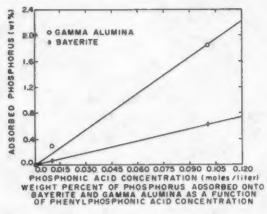
(c) providing nutrient for said strain within said water stream including iron ions which precipitate when contacted with sulfides; and

(d) contacting said water containing said sulfides and nutrient with said immobilized strain and calcium carbonate in a packed or fluidized bed reactor whereby said strain oxidizes said sulfide to sulfate and whereby said strain derives iron nutrient from said precipitated iron.

4,880,543
SUPERCRITICAL FLUID CHROMATOGRAPHY PACKING MATERIAL CONTAINING ALUMINA

Robinson P. Khosah, Point Breeze; John W. Novak, New Kensington; Douglas G. Weaver, Monroeville; Karen R. Fraser-Milla, Wilkinsburg, and Richard R. Burr, Leechburg, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 090,880, Aug. 31, 1987, Pat. No. 4,816,159. This application Jul. 1, 1988, Ser. No. 214,309
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 10 Claims



1. A method of separating squalene from shark liver oil under supercritical fluid conditions, the method comprising the steps of:

(a) providing a bed containing alumina particles;

(b) introducing shark liver oil to the bed;

(c) adding CO_2 to said bed under supercritical fluid conditions;

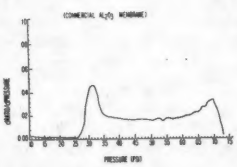
(d) removing CO_2 and squalene from the bed; and

(e) separating the squalene from the CO_2 by returning the CO_2 to nonsupercritical conditions.

4,880,544
CRYSTAL GROWTH PROCESS FOR PREPARING INORGANIC DYNAMIC MEMBRANES

Joseph P. Barone, Westford, Mass., assignor to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 926,927, Nov. 3, 1986, Pat. No. 4,808,311.
This application Nov. 10, 1988, Ser. No. 269,509
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—639 2 Claims



1. The process for forming a composite membrane comprising a porous inorganic substrate and an integral particle porous film directly bound only to one surface of said substrate, said particle porous film being bonded together by crystal growth to form an integral film which comprises depositing a film of said inorganic particles said one surface of said inorganic porous substrate and passing a solution supersaturated with a composition comprising the composition of said inorganic particles through said film thereby to effect crystal growth on said particles until a bonded porous of said particles is formed.

4,880,545

ULTRA-FILTRATION MEMBRANES AND A METHOD FOR THE SEPARATION OF SUGARS USING THE SAME

A. Xavier Swamikannu, Des Plaines, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 18, 1988, Ser. No. 272,971

Int. Cl.[4] B01D *13/00, 13/04*

U.S. Cl. 210—654 22 Claims

1. An ultra-filtration membrane comprising structure for achieving a delicate balance between selectivity and water reflux in the separation of preselected water soluble components consisting essentially of a porous support backing material having composited thereon an interfacial polymerized condensation product of the reaction between a polymeric amine produced from the reaction between a polyepihalohydrin and a primary amine containing a substituent selected from the group consisting of hydroxy, alkoxy and carboxyl radicals and a compound selected from the group consisting of aromatic polycarboxylic acid chlorides, alicyclic polycarboxylic acid chlorides, aliphatic polycarboxylic acid chlorides, aromatic polycarboxylic acid anhydrides and aromatic diisocyanates.

4,880,546

RECOVERY OF TRANSITION METALS FROM AQUEOUS SOLUTIONS

Brian L. Goodall, Akron, Ohio, and Paulus A. M. Grotenhuis, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 16, 1988, Ser. No. 285,464

Claims priority, application United Kingdom, Dec. 17, 1987, 8729446

Int. Cl.[4] B01D *17/00*

U.S. Cl. 210—699 14 Claims

1. A process comprising recovering a transition metal from an aqueous solution containing a complex of said transition metal with a cyclic phosphite having a bridgehead phosphorus atom linked to three oxygen atoms at least two of which form together with the bridgehead phosphorus atom part of a ring, said cyclic phosphite having a hydroxymethyl group linked to a ring carbon atom, by:

(a) hydrolyzing the cyclic phosphite in said complex, thereby forming a reaction mixture,

(b) contacting the reaction mixture obtained in step (a) with a compound forming a water-stable complex with said transition metal which is sufficiently water-stable to preclude the need to distill off water in order to achieve substantially complete recovery of said transition metal.

(c) contacting the reaction mixture obtained in step (b) with an organic extraction agent for said water-stable complex, thereby forming an organic extract phase containing at least a portion of said transition metal, and an aqueous raffinate phase, and

(d) separating said organic extract phase containing at least a portion of said transition metal from said aqueous raffinate phase.

4,880,547

METHODS FOR WATER TREATMENT

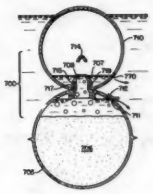
Kenji Etani, 26 Clinton Dr. #112, Hollis, N.H. 03049

Continuation-in-part of Ser. No. 93,186, Sep. 4, 1987, Pat. No. 4,775,485, which is a division of Ser. No. 488,597, Apr. 22, 1983, Pat. No. 4,692,314, which is a continuation-in-part of Ser. No. 40,302, May 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 934,425, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 717,514, Aug. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,536, Jun. 30, 1975, abandoned. This application Mar. 16, 1988, Ser. No. 169,230

The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.

Int. Cl.[4] C02F *1/56, 1/76*

U.S. Cl. 210—728 9 Claims



1. A process for feeding water-treatment chemicals into a water system comprising the steps of:

providing a feeder in the form of a substantially spherical shell of waterproof plastic of substantially neutral buoyancy having an upper hemisphere with a filler port and closure therefore, and a number less than 26 of feed holes greater than five-thousandths of an inch (0.005") in diameter and less than three square millimeters in cross section;

containing a dose of water-treatment chemicals and having a number and size of said holes selected to provide a desired rate of feeding of said chemical;

placing said feeder so as to be free to move about and roll within an intermediate velocity chamber of said water-treatment system which also includes a body of water and means to cause a flow of water of said body through said system; and

subjecting said feeder to said flow thereby to extract said chemicals at a substantially uniform rate into said water,

wherein said dose consists essentially of a charge of a first water-soluble treatment chemical which is introduced through said port into the top of said feeder in a dehydrated granular form, said first chemical being capable of taking up and forming a weak chemical bond with a substantial amount of water, and a second treatment chemical which is supplied in aqueous solution, added to said first chemical in said feeder to create with said first chemical, a substantially homogeneous mass adherent to the bottom of said feeder, and

whereby in the absence of said flow, said feeder is urged by said mass to repose with said number of holes upward, thereby substantially to stop the feeding of said chemicals.

4,880,548

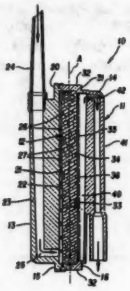
DEVICE AND METHOD FOR SEPARATING LEUCOCYTES FROM PLATELET CONCENTRATE

David B. Pall, Roslyn Estates, and Thomas C. Gsell, Glen Cove, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 156,894, Feb. 17, 1988, abandoned. This application Apr. 25, 1988, Ser. No. 185,993

Int. Cl.[4] B01D *39/04*

U.S. Cl. 210—767 94 Claims



1. A device for the depletion of the leucocyte content of a platelet concentrate comprising a porous, fibrous medium having a CWST of at least about 90 dynes/cm.

4,880,549

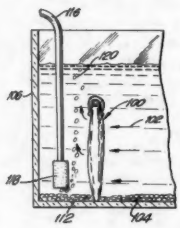
METHOD OF FILTERING IN AN AQUARIUM TANK WITH A FILTER ENVELOPE

Allan H. Willinger, Oakland, and Klaus Woltmann, Demarest, both of N.J., assignors to Willinger Brothers, Inc., Oakland, N.J.

Division of Ser. No. 871,106, Jun. 5, 1986, Pat. No. 4,783,298. This application Aug. 17, 1988, Ser. No. 233,246

Int. Cl.[4] B01D *37/00*

U.S. Cl. 210—805 2 Claims



1. A method of filtering an aquarium tank, comprising placing a filter envelope of non-woven foraminous filter material with soft pliable edges diagonally across a corner of an aquarium tank having water therein; extending an air line tubing into the tank water and behind the filter envelope, and pumping air into the air line tubing, whereby an aquarium water passes through the filter envelope to a space behind the envelope to be filtered by the envelope and also retains the envelope in place.

4,880,550

PREPARATION OF HIGH BASE CALCIUM SULFONATES

Mack W. Hunt, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Aug. 26, 1988, Ser. No. 237,146

Int. Cl.[4] C10M *135/10, 125/22*

U.S. Cl. 252—33 5 Claims

1. A method for preparing a carbonate overbased calcium sulfonate which utilizes a single-stage carbonation, wherein the resulting overbased product has a metal ratio of at least about 10 and a TBN in the range of about 250 to 400, which method comprises: forming a first mixture consisting essentially of a lower molecular weight alkanol, an alkyl or alkaryl-substituted sulfonic acid or sulfonate compound, a diluent, and a solvent; (2) adding a calcium compound to said first mixture to form a second mixture in which the amount of added calcium is at least about 10 times the amount necessary to form a neutral calcium sulfonate; (3) heating the second mixture to its reflux temperature; (4) subjecting the second mixture to a single carbonation at said reflux temperature to form a carbonated product while simultaneously and continuously removing an overhead comprising water produced during the carbonation reaction; (5) after carbonation is stopped, heating the carbonated product to an elevated temperature sufficient to remove the alkanol; and (6) removing solids and solvent from the carbonated product to obtain the final overbased product.

4,880,551

ANTIOXIDANT SYNERGISTS FOR LUBRICATING COMPOSITIONS

Lester A. Doe, Newtown, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 204,487, Jun. 6, 1988, abandoned. This application Apr. 3, 1989, Ser. No. 333,874

Int. Cl.[4] C10M *105/72, 105/22*

U.S. Cl. 252—47.5 2 Claims

1. A lubricating composition comprising a major portion of a mineral oil or synthetic lubricating oil, fluid or grease and 0.01 to 5.0 percent by weight of an antioxidant composition consisting of

(a) 1-[di(4-octylphenyl)aminomethyl]tolutriazole and

(b) at least one antioxidant selected from the group consisting of methylenebis(di-n-butyldithiocarbamate), 2,6-di-t-butyl-4-sec-butylphenol, 2,6-di-t-butyl-4-methylphenol and butylated phenol mixture, wherein the weight ratio of component (a) to component (b) ranges from about 1:4 to 4:1.

4,880,552

WATER-SOLUBLE ADDITIVES HAVING EXTREME PRESSURE EFFECT FOR AQUEOUS FUNCTIONAL FLUIDS, FUNCTIONAL FLUIDS AND CONCENTRATED AQUEOUS COMPOSITIONS CONTAINING THE ADDITIVES

Patrice Guesnet, Pau, France; Tetsuchi Kawamura, Tokyo, Japan; Gérard Savin, Serre-Castet, France; Sabine Poncet, Pau, France, and Charles Castera, Sainte-Suzanne, France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Apr. 21, 1988, Ser. No. 184,425

Claims priority, application France, Apr. 24, 1987, 87 05778

Int. Cl.[4] C10M *135/26*

U.S. Cl. 252—34 22 Claims

1. In a method of machining metals in the presence of an aqueous functional fluid containing an extreme pressure additive comprising incorporating a water-soluble salt into synthetic or semisynthetic fluid wherein the improvement is a water-soluble salt of 3-mercaptopropionic acid disulphide.

4,880,553

METHYLENE LINKED AROMATIC POUR POINT DEPRESSANT

Joseph L. Kostusyk, Euclid, and Syed Q. A. Rizvi, Painesville, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 814,692, Dec. 30, 1985, Pat. No. 4,753,745. This application Apr. 5, 1988, Ser. No. 178,048
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.[4] C10M *131/06, 147/02*
U.S. Cl. 252—58 5 Claims

1. A composition comprising compounds having molecular weights ranging from at least as low as 271 to at least as high as 300,000 the compounds have the general structural formula (I):

$$Ar(R)—[Ar'—(R')]Ar'' \quad (I)$$

wherein the Ar, Ar' and Ar'' are independently an aromatic moiety containing 1 to 3 aromatic rings and the composition includes compounds wherein aromatic moieties are present with 0 substituents, 1 substituent, 2 substituents and 3 substituents, (R) and (R') are independently an alkylene group containing about 1 to 100 carbon atoms with the proviso that some compounds are present in the composition wherein at least one of (R) or (R') is CH_2, and n is 0 to about 1000, the substituents being selected from the group consisting of substituents derived from olefins and substitients derived from chlorinated hydrocarbons.

4,880,554

THERMOPLASTIC BLEND OF POLYCARBONATE, POLYMETHYLMETHACRYLATE AND AES

Thomas H. Newman; David E. Henton, and Silvia A. Evans, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 22, 1988, Ser. No. 234,713
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—67 7 Claims

1. The thermoplastic blend comprising:
from about 40% to about 80% polycarbonate;
from about 5% to about 40% of rubber-modified polymethylmethacrylate; and
from about 15% to about 50% of the olefin-diene rubber-modified styrene-acrylonitrile resin.

4,880,555

ENZYME HYDROLYZED MALTODEXTRIN CONTAINING FINISHER/PRESERVER/CLEANER COMPOSITION FOR LITHOGRAPHIC PRINTING PLATES

John E. Walls, Hampton, and Major S. Dhillon, Belle Mead, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 15, 1988, Ser. No. 244,924
Int. Cl.[4] B41F *35/00;* C11D *3/22, 3/30, 3/44*
U.S. Cl. 252—143 20 Claims

1. A composition for finishing, preserving and cleaning lithographic printing plates consisting essentially of a stable emulsion of:
(a) from about 0.1% to about 7.0% by weight of the composition of a polyol selected from the group consisting of ethylene glycol, propylene glycol, sorbitol and glycerin having a molecular weight in the range of from about 50 to about 2,000; and
(b) from about 1.0% to about 12.0% by weight of the composition of a maltodextrin obtained by the enzyme hydrolysis of corn or potato starch, said maltodextrin having a viscosity of from about 6,000 to about 9,000 cps when measured as a 25% solution in deionized water at 22° C.; and
(c) from about 0.1% to about 3.0% by weight of the composition of a mixture of a C_{18} to C_{30} alcohol and an aminated, aliphatic C_8 to C_{24} alcohol sulfate wherein the ratio of alcohol to sulfate ranges from about 1:1 to about 5:1; and
(d) from about 5.0% to about 20.0% by weight of the composition of a composition of hydrocarbons having a boiling point in the range of from about 175° F. to about 500° F., and a flash point of above about 100° F., said composition of hydrocarbons containing less than about 10% aromatic components; and
(e) from about 0.1% to about 3.0% by weight of the composition of a substituted phenoxypoly(oxyethylene)ethanol wherein the substitution is H, isooctyl, nonyl, decy or dodecyl, having a hydrophile/lipophile balance of from about 8 to about 15; and
(f) from about 0.05% to about 1.0% by weight of the composition of a mono-, di- or tri-ethanolamine; and
(g) sufficient water to formulate an effective finishing, preserving and cleaning composition for lithographic printing plates; and
(h) a sufficient amount of an organic or inorganic acid to impart a pH to the composition of from about 2.5 to about 6.5.

4,880,556

AQUEOUS ALKALI METAL HALOGENITE COMPOSITIONS CONTAINING A COLORANT

Richard S. Hutchings, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 54,347, May 26, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 243,105
Int. Cl.[4] C11D *7/06, 7/12*
U.S. Cl. 252—156 26 Claims

1. An aqueous, alkaline cleaning composition having a pH of about 9 or above comprising on a weight basis from about 0.01 to about 5% of an alkali metal halogenite; from about 0.01 to about 3% of a colorant normally chemically incompatible with said halogenite in aqueous media, and a stabilizer selected from the group consisting of alkali metal carbonate and borate salts and mixtures thereof, said stabilizer being present in the composition in an amount effective to stabilize the composition as evidenced by a substantial absence of chlorine dioxide in the composition.

4,880,557

SPRAY LUSTERING-CLEANSING AGENT

Sosaburo Ohara, Tokyo; Atsushi Ikeda, Fujisawa; Seigo Shinohara, Chigasaki, and Tetsuo Kijima, Fujisawa, all of Japan, assignors to Taiho Industries Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 33,352, Apr. 2, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 180,182
Claims priority, application Japan, Aug. 21, 1986, 61-194038
Int. Cl.[4] C11D *7/22*
U.S. Cl. 252—174.15 3 Claims

1. Spray lustering-cleansing agent, prepared by charging a spray can with an emulsified basic material in combination with a propellant and a foam regulating agent, said bsic material substantially comprising 5.0 to 60.0 wt. % of a silicone oil emulsified with water using an emulsifier, 0.1 to 10.0 wt. % of an emulsifier, a water-soluble organic base which is at least one member selected from the group consisting of sodium benzoate, sodium citrate, sodium malate, ammonium benzoate, triethanol amine and diethanol amine and which adjusts the pH value of the spray lustering-cleansing agent to within a range of 8.0 to 11.0 and which enables the foam of said lustering-cleansing agent to exhibit improved adhesiveness to a tire, and water.

4,880,558

LIQUID CLEANING PREPARATION FOR HARD SURFACES

Frantisek Jost, Duesseldorf, and Klaus-Dieter Wisotzki, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,154

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720262

Int. Cl.[4] C11D *3/37*

U.S. Cl. 252—174.23 29 Claims

1. An aqueous cleaning composition comprising:

(a) from about 0.5 to about 40% by weight of at least one surfactant;

(b) from about 0.01 to about 1% by weight of a mixture of

(i) at least one polyacrylamide, and

(ii) at least one polyethoxylated monofunctional or polyfunctional alkanol; and

(c) from 0 to about 6% by weight of at least one builder:

wherein the at least one polyacrylamide component (b)(i) is a homopolymer or copolymer or acrylamide having a molecular weight of from about 300,000 to about 15,000,000; component (b)(ii) is at least one adduct of 30 to 150 moles of ethylene oxide with a terminal alkanol containing from 12 to 22 carbon atoms; the weight ratio of component b)i) to component (b)(ii) is from about 1 : 3 to about 3 : 1; and the composition when diluted to from about 2 to about 20 g/l in water has a pH in the range of from 7.0 to about 10.5; and wherein when the at least one polyacrylamide component (b)(i) is a copolymer of acrylamide, one or more monomers other than acryalmide is present in a molar quantity of up to about 50 mole % thereof and which monomers selected from the group consisting of acrylic acid, methacrylic acid, C_1-C_4 alkyl esters of the foregoing, methacrylamide, ethylene, propylene, isobutylene, vinyl acetate, and styrene.

4,880,559

CERIC ACID DECONTAMINATION OF NUCLEAR REACTORS

Alexander P. Murray, Murrysville Boro; Clifton G. Slater, Wilkinsburg, and Robert W. White, New Kensington, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 930,196, Nov. 13, 1986, abandoned, which is a division of Ser. No. 802,132, Nov. 26, 1985, Pat. No. 4,657,596, which is a continuation-in-part of Ser. No. 615,018, May 29, 1984, abandoned. This application Jun. 15, 1988, Ser. No. 208,825

Int. Cl.[4] G21F *9/00;* C23G *1/02*

U.S. Cl. 252—186.21 3 Claims

1. A composition consisting of

(A) water;

(B) about 0.5 to about 3% by weight of a ceric acid selected from the group consisting of tetrasulfato ceric acid, hexasulfamato ceric acid, hexaperchlorato ceric acid, and mixtures thereof; and

(C) and about 1 to about 5% by weight of an inorganic acid, where said inorganic acid is sulfuric acid when said ceric acid is tetrasulfato ceric acid, sulfamic acid when said ceric acid is hexasulfamato ceric acid, perchloric acid when said ceric acid is hexaperchlorato ceric acid, and a corresponding mixture selected from the group consisting of sulfuric acid, sulfamic acid, and perchloric acid when said ceric acid is a mixture selected from the group consisting of tetrasulfato ceric acid, hexasulfamato ceric acid, and hexaperchlorato ceric acid.

4,880,560

LACTIC ACID DERIVATIVE, LIQUID CRYSTAL COMPOSITION CONTAINING SAME AND LIQUID CRYSTAL DEVICE

Kazuo Yoshinaga, Machida; Kazuharu Katagiri, Tama, and Kenji Shinjo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

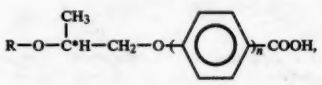
Division of Ser. No. 922,308, Oct. 23, 1986, Pat. No. 4,812,259. This application Jan. 3, 1989, Ser. No. 292,953

Claims priority, application Japan, Nov. 1, 1985, 60-245709; Dec. 13, 1985, 60-280403

Int. Cl.[4] C07C *65/21, 65/24;* C09K *19/52, 19/12*

U.S. Cl. 252—299.01 21 Claims

1. An optically active lactic acid derivative represented by the formula (Ia):



(Ia)

wherein

R is a linear alkyl group having 1–16 carbon atoms,

n is 1 or 2, and

C* is an asymmetric carbon atom.

4,880,561

OPTICALLY ACTIVE COMPOUND AND LIQUID CRYSTALLINE COMPOSITION

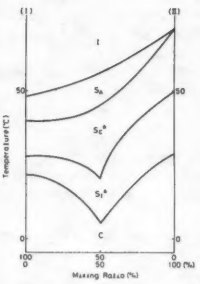
Tatsuru Tabohashi; Takao Sakurai; Ryoichi Higuchi; Naoko Mikami; Eri Yamamoto, and Koji Takeuchi, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 38,897

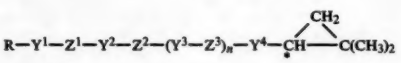
Claims priority, application Japan, Apr. 21, 1986, 61-091859; Sep. 24, 1986, 61-225713

Int. Cl.[4] C09K *19/34, 19/30;* C07C *69/76, 69/74*

U.S. Cl. 252—299.61 9 Claims

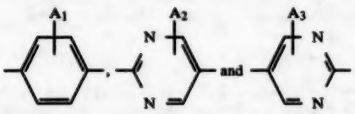


7. A liquid crystal composition, comprising at least two components, at least one of which is an optically active cyclopropane compound having the formula (I):



(I)

wherein R represents a linear or branched alkyl group of 4–18 carbon atoms or a cyclopropyl group; n is 0, Y^4 is —OCO— or —CO_2CH_2—; Y^1 represents a direct bond, —O—, —CO_2— or —OCO—; Y^2 represents —CO_2—, —OCO—, O a direct bond or —CH_2O—; and Z^1 and Z^2 are each selected from the group consisting of:



wherein at least two of said Z^1 and Z^2 groups are the same or different, with the proviso that, not more than one of Z^1 and Z^2 are a pyrimidine ring at the same time and R is a cyclopropyl group only when Y^1 is $—CO_2$; A^1, A^2 and A^3 each represent a fluorine atom, a bromine atom, a chlorine atom, a cyano group or a hydrogen atom and the

indicates an asymmetric carbon atoms.

4,880,562

LIQUID CRYSTAL COMPOUND

Kisei Kitano; Manabu Uchida; Makoto Ushioda, and Toshiharu Suzuki, all of Kanagawa, Japan, assignors to Chisso Corporation, Ohsaka, Japan

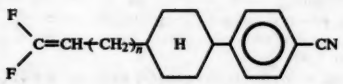
Filed Feb. 17, 1989, Ser. No. 312,053

Claims priority, application Japan, Feb. 26, 1988, 63-43385

Int. Cl.[4] G02F *1/13*; C09K *19/30*; C07C *121/70*

U.S. Cl. 252—299.63 **4 Claims**

1. A compound expressed by the formula



(I)

wherein n represents an integer of 0 to 20.

4,880,563

COMPOSITION FOR PERSONAL CARE PRODUCT COMPRISING ALKOXYLATED FATTY ALCOHOL AND POLYSILOXANE

Gerd Dahms, Velbert, Fed. Rep. of Germany, assignor to Deutsche ICI GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 890,337

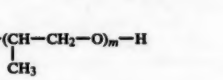
Claims priority, application United Kingdom, Aug. 1, 1985, 8519426

Int. Cl.[4] A61K *9/10*; B01F *17/42, 17/54*

U.S. Cl. 252—312 **5 Claims**

1. An emollient composition consisting of:

(A) 5–95% by weight of an alkoxylated polyether of the formula:



where

R is a C_6 to C_{22} hydrocarbyl group, saturated or unsaturated and may be substituted; and

m is 2 to 50; and

(B) 95–5% by weight of tetra(dimethylcyclosiloxane) or penta(dimentylcyclosiloxane) or mixtures thereof.

2. Oil in water or water in oil emulsion containing from 2 to 30% by weight of an emollient composition which is included in the oil phase and consists essentially of

(A) 5–95% by weight, relative to the weight of the emollient composition, of an alkoxylated polyether of the formula: where

R is a C_6 to C_{22} hydrocarbyl group, saturated or unsaturated and may be substituted; and

m is 2 to 50; and

(B) 95–5% by weight, relative to the weight of the emollient composition, of tetra(dimethylcyclosiloxane) or penta(-dimethylcyclosiloxane) or mixtures thereof.

4,880,564

ANTIFOAMS FOR AQUEOUS SYSTEMS AND THEIR USE

Heinz Abel, Reinach; Christian Guth, Birsfelden, and Hans-Ulrich Berendt, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 21, 1987, Ser. No. 99,034

Claims priority, application Switzerland, Sep. 29, 1986, 3889/86

Int. Cl.[4] B01D *17/00*

U.S. Cl. 252—321 **12 Claims**

1. An antifoam for aqueous systems, whichcomprises

(1) 0.5 to 5% by weight of an alkaline earth metal salt of a C_{10}–C_{24}-fatty acid,

(2) 25 to 45% by weight of a di-C_2–C_{12}-alkyl ester of an unsaturated dicarboxylic acid,

(3) 25 to 45% by weight of a mineral oil having a flashpoint above 100° C., a pour-point of −3° to −60° C. and an aniline point of 70° to 110° C.,

(4) 5 to 15% by weight of a non-ionic emulsifier,

(5) 5 to 15% by weight of an anionic emulsifier and

(6) 0.5 to 3% by weight of an alkylenediamide of the formula $R_3—NH—R_4—NH—R_3$ wherein R_3 is an alkanoyl radical having 14 to 22 C atoms and R_4 is an alkylene radical having 2 to 6 C atoms.

4,880,565

FLUORINE CONTAINING VISCOELASTIC SURFACTANTS

Gene D. Rose; Arthur S. Teot, both of Midland, Mich., and Keith G. Seymour, Maryville, Mo., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 528,314, Aug. 31, 1983, Pat. No. 4,770,814. This application Apr. 12, 1985, Ser. No. 722,484

Int. Cl.[4] B01F *17/18, 17/26*; B01J *13/00*

U.S. Cl. 252—355 **8 Claims**

1. An aqueous composition which comprises:

(a) surfactant ions each consisting of a fluoroaliphatic, hydrophobic moiety chemically bonded to a cationic, hydrophilic moiety;

(b) organic counterions that associate with the surfactant ions in the aqueous composition thereby forming a viscoelastic surfactant; and

(c) water.

4,880,566

SILICATE-AND MAGNESIUM-FREE STABILIZER MIXTURES

Bernd D. Baehr, Neuss; Ulrich Rall, Langenfeld; Hildegard van Delden, Hilden, and Wolfgang Lillotte, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 945,921, Dec. 23, 1986, abandoned. This application Dec. 22, 1988, Ser. No. 290,881

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 3545909

Int. Cl.[4] C09K *15/32, 3/100*; C23F *11/00*; C01B *15/01*

U.S. Cl. 252—389.22 **7 Claims**

1. An aqueous bath comprising 35% by weight hydrogen peroxide solution containing a silicate-free and magnesium-free stabilizer mixture therefor, said stabilizer mixture consisting essentially of:

(A) from about 5 to about 30% by weight of polyhydroxy carboxylic acid and/or hydroxy carboxylic acid, and their alkali metal and/or ammonium salts;

(B) from about 1 to about 5% by weight of polyacrylic acid, and said acid in partially neutralized form; and

(C) from about 2 to about 20% by weight of polyamine-polyphosphonic acid and/or amine-polyphosphonic acid, and their alkali metal and/or ammonium salts; with the proviso that the ratio by weight of components A:B:C is 1 to 6:0.2 to 1:0.4 to 4.

4,880,567

THICK FILM COPPER CONDUCTOR INKS

Ashok N. Prabhu, E. Windsor Township, Mercer Country; Kenneth W. Hang, W. Windsor Township, Mercer County, and Edward J. Conlon, Princeton Township, Mercer County, all of N.J., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 87,556, Aug. 20, 1987, Pat. No. 4,816,615. This application Dec. 9, 1988, Ser. No. 281,605

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—512 **6 Claims**

1. A copper conductor ink comprising, on a weight basis:

(a) from about 65 to about 85 percent of copper powder;

(b) from about 2 to about 10 percent of a devitrifying glass frit selected from the group consisting of a zinc-calcium-aluminum-silicate glass frit, a zinc-magnesium-barium-aluminum-silicate glass frit and mixtures thereof;

(c) from about 1 to about 8 percent of an adhesion promoting oxide selected from the group consisting of bismuth oxide, cadmium oxide, cuprous oxide, thallium oxide, lead oxide and mixtures thereof; and

(d) from about 5 to about 25 percent of a suitable organic vehicle.

4,880,568

METHOD AND COMPOSITION FOR THE REMOVAL OF AMMONIUM SALT AND METAL COMPOUND DEPOSITS

Charles M. Staley, Houston, and Verle E. Cornish, Missouri City, both of Tex., assignors to Aqua Process, Inc., Houston, Tex.

Division of Ser. No. 87,497, Aug. 19, 1987, Pat. No. 4,793,865. This application Aug. 11, 1988, Ser. No. 231,519

Int. Cl.[4] C11D *3/26*

U.S. Cl. 252—548 **7 Claims**

1. A composition for treating a refinery or a hydrocarbon processing unit to effect the removal of ammonium salt and metal compound deposits, comprising:

an oxygen-containing amine suitable for reacting with the ammonium salt deposit to form an amine salt; and

an oxygenated hydrocarbon compound suitable for reacting with the metal compound deposits to form a chelate, the oxygenated hydrocarbon compound having at least two oxygens, one of which is part of a keto group in the hydrocarbon compound.

4,880,569

CONCENTRATED LIQUID DETERGENT COMPOSITION CONTAINING ANIONIC SURFACTANTS HAVING NON-TERMINAL SULFONATE GROUPS

Francis J. Leng, and Christine A. Leng, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 875,430, Jun. 17, 1986, abandoned. This application Jan. 5, 1988, Ser. No. 142,291

Claims priority, application United Kingdom, Jun. 21, 1985, 8515721; Oct. 4, 1985, 8524602

Int. Cl.[4] C11D *1/14, 1/72*

U.S. Cl. 252—550 **15 Claims**

1. An isotropic liquid detergent composition comprising

(i) at least 40 wt% and less than 92 wt% of a mixture of surfactants, at least 50 wt% of the surfactants present comprising:

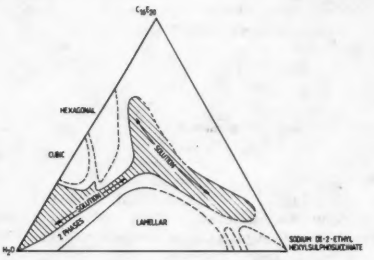
(a) a polyalkoxy nonionic surfactant,

the nonionic surfactant having a hydrophile-lipophile balance of at least 14.5, said nonionic surfactant being

$$CH_3(CH_2)_{n-1}(CH_2CH_2O)_mOH$$

wherein n ranges from 2 to 24 and m is an integer which will achieve said hydrophile-lipophile balance; and

(b) an anionic surfactant having a non-terminal ionic head group with two or more hydrocarbon chains extending from the head group, each chain being no more than 10



carbon atoms in length and the chains having a total length of at least 8 carbon atoms, said ionic surfactant selected from the group consisting of dialkyl sulphosuccinate, secondary alkyl sulfate, dialkyl phosphate, and alkylbenzene sulfonate, said sulfonate having a benzene ring attached to a secondary alkyl carbon atom;

wherein the ratio of (a) to (b) lies within the range of from 1:9 to 9:1, and

(ii) at most 60 wt% and more than 8 wt% water, said liquid detergent composition being free of additional hydrotropes.

4,880,570

ELECTROCONDUCTIVE ADHESIVE

James A. Sanborn, Satellite Beach, and Bobby J. Boan, Indian Harbour Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 846,537, Mar. 31, 1986, abandoned. This application Nov. 2, 1988, Ser. No. 267,752

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—512 **5 Claims**

1. An electroconductive adhesive consisting essentially of:

(a) an epoxy resin from the modified epoxy family consisting of a mixture of a polygylcidylaminophenyl compound and a polygylcidylether of polyformaldehyde novolac compound;

(b) a catalyst consisting of a combination of one member being an aliphatic amide amine and one member being an aliphatic polyamine;

(c) a mixture of differently shaped conductive particles having a substantially uniform concentration and a random distribution of shapes throughout said adhesive so as to minimize the steric interference and provide conductivity in substantially all directions;

the percent by weight of (a), (b), and (c) being between 10% and 17%, between 4% and 10%, and between 63% and 73%, respectively.

4,880,571
PROCESS FOR THE PREPARATION OF 5-NITRO-1,4-NAPHTHOQUINONE

Christos Comninellis, Mex; Robert U. Osterwalder, Basel; Eric Plattner, Seltisberg, and Gottfried Seifert, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

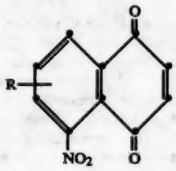
Filed Oct. 22, 1986, Ser. No. 921,918

Claims priority, application Switzerland, Oct. 24, 1985, 4580/85

Int. Cl.[4] C07C *50/12*; C07L *50/00*

U.S. Cl. 552—297 **10 Claims**

1. A process for the preparation of 5-nitro-1,4-naphthoquinones of formula



wherein R is hydrogen, a C_1–C_4 alkyl radical or a C_1–C_4 alkoxy radical, by oxidation of 1-nitronaphthalene or a suitably substituted 1-nitronaphthalene, which process comprises carrying out the reaction with manganese(III) sulfate as oxidising agent.

4,880,572
UN-NATURAL CERAMIDE RELATED COMPOUNDS AND PREPARATION THEREOF

Shuji Fujita, Tachikawa; Shoji Yoshimura, Iruma; Masayoshi Ito, Kunitachi; Yoshiyasu Shitori, Tokyo, and Tomoya Ogawa, Musashino, all of Japan, assignors to MECT Corporation, Japan

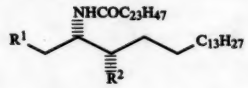
Filed May 26, 1988, Ser. No. 199,107

Claims priority, application Japan, May 28, 1987, 61-132696

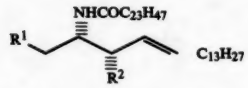
Int. Cl.[4] C09F *5/00*

U.S. Cl. 260—404 **17 Claims**

1. An unnatural ceramide related compound represented by the formulas (I) or (II):



(I)



(II)

wherein R^1 and R^2 are independently hydroxyl group, acetoxy group or 1-ethoxyethyloxy group.

4,880,573
PROCESS FOR ELIMINATING CHOLESTEROL CONTAINED IN A FATTY SUBSTANCE OF ANIMAL ORIGIN AND THE FATTY SUBSTANCE WITH REDUCED CHOLESTEROL OBTAINED

Jean Courregelongue, and Jean-Pierre Maffrand, both of Portet/Garonne, France, assignors to Monserbio, Annecy, France

Filed Jul. 15, 1987, Ser. No. 73,458

Claims priority, application France, Jul. 24, 1986, 86 10982

Int. Cl.[4] C09F *5/10*; A23C *12/02*

U.S. Cl. 260—420 **13 Claims**

1. Process for eliminating cholesterol contained in a fatty substance of animal origin used in human diet of the group consisting of butter, suet and lard, which process comprises putting the liquefied fatty substance into contact with a cyclodextrin, continuing this contact under stirring for 30 minutes to 10 hours at a temperature between the fusion temperature of the fatty substance and 80° C., in such a way as to allow the formation of complexes between the cholesterol and the cyclodextrin, and separating the said complexes by entrainment in water and separation of the aqueous phase.

4,880,574
METHOD FOR REFINING GLYCERIDE OILS USING PARTIALLY DRIED AMORPHOUS SILICA HYDROGELS

William A. Welsh, Fulton, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 679,348, Dec. 7, 1984, Pat. No. 4,629,588, and a continuation-in-part of Ser. No. 823,217, Jan. 28, 1986, Pat. No. 4,734,226. This application Nov. 24, 1986, Ser. No. 934,058

Int. Cl.[4] C09F *5/10*

U.S. Cl. 260—428 **14 Claims**

1. A process for the removal of trace contaminants, which are phospholipids and associated metal ions, from glyceride oils by adsorbing said trace contaminants onto amorphous silica, comprising:

(a) selecting a glyceride oil with a phosphorous content in excess of about 1.0 ppm,

(b) selecting an adsorbent comprising a partially dried amorphous silica hydrogel having a moisture content of at least about 25 weight percent and an average pore diameter of less than 60 Angstroms,

(c) contacting the glyceride oil of step (a) and the adsorbent of step (b),

(d) allowing said trace contaminants to be adsorbed onto said adsorbent, and

(e) separating the resulting phospholipid- and metal ion-depleted glyceride oil from the adsorbent.

4,880,575
OLEFINIC DIPHOSPHONIC ACIDS, A PROCESS FOR THEIR PRODUCTION, THEIR USE AS THRESHOLDERS AND COMPLEXING COMPOSITIONS CONTAINING THEM

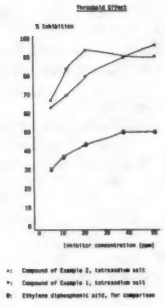
Helmut Blum, Duesseldorf, and Siglinde Hemmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 223,473

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724653

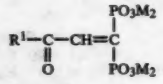
Int. Cl.[4] C07F *9/38*

U.S. Cl. 562—21 **9 Claims**



6. A process for the preparation of 3-R^1-3-oxoprop-1-ene-

1,1-diphosphonic acids corresponding to the following general formula



(II)

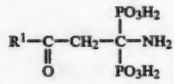
wherein R^1 represents

a tertiary alkyl group having the formula $—(R^2)C(R^3)(R^4)$, where R^2 and R^3 independently of one another represent a C_1–C_3 alkyl group, and R^4 represents a C_1–C_{10} alkyl group, or

an unsubstituted or methyl or ethyl substituted cycloalkyl group, or

an aryl or heteroaryl group which is unsubstituted or substituted by halogen, C_1–C_5 alkoxy, di-C_1–C_5-alkylamino, or C_1–C_5 alkyl; and the M groups are H, or alkali metal or ammonium cations, comprising the steps of

(a) reacting a 3-R^1-oxo-1-aminopropane-1,1-diphosphonic acid of the formula



(IV)

in which R^1 is as defined above, with aqueous or alcoholic alkali metal hydroxide solution, wherein the molar ratio of alkali metal hydroxide to starting material is in the range of from about 5:1 to about 20:1, at a temperature in the range of from about 80° to about 150° C., to form a reaction mixture,

(b) adding water to the reaction mixture to form a clear aqueous solution,

(c) adding to the clear aqueous solution an alcohol infinitely miscible in water to precipitate therefrom the compound of formula III in which the M groups are alkali metal cations,

(d) treating the compound of formula III in which the M groups are alkali metal cations with an acidic reagent to convert the M groups to hydrogen, and, where the M groups in the compound of formula III are to be other than hydrogen,

(e) treating the compound of formula 111 in which the M groups are hydrogen with a basic reagent of the formula M^+OH^- in which M^+ is an alkali metal or ammonium cation $R^5R^6R^7R^8N^+$, wherein R^5, R^6, R^7 and R^8 independently of one another are hydrogen or a branched or unbranched C_1–C_{12} alkyl radical.

4,880,576

ACID HALIDES, A PROCESS FOR THEIR PREPARATION

Heinz U. Blank, Odenthal; Norbert Langenfeld, Cologne, and Wolfgang Heydkamp, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

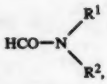
Division of Ser. No. 553,277, Nov. 17, 1983, abandoned, which is a continuation of Ser. No. 313,397, Oct. 20, 1981, abandoned. This application Sep. 17, 1986, Ser. No. 908,460

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039999

Int. Cl.[4] C07C *51/60, 143/70*

U.S. Cl. 562—828 **12 Claims**

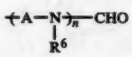
1. In a process for preparing an organic acid chloride from the corresponding acid or a salt thereof by contacting said acid or salt thereof with an inorganic acid halide, the improvement which comprises carrying out the process in the presence of an N-alkylated formamide of the formula



wherein

R^1 is alkyl with 1 to 4 carbon atoms,

R^2 is alkyl with at least 9 carbon atoms or the group



wherein

A is straight-chain or branched alkanediyl,

R^6 is lower alkyl and

n is an integer from 2 to 6, wherein said inorganic acid halide has the formula $XHal_2$, wherein Hal is chlorine and X is selected from the group consisting of CO, SO and SO_2 and wherein the organic acid chloride is selected from the group consisting of chloro acetic acid chloride, dichloro acetic acid chloride, benzoic acid chloride, o-chloro benzoic acid chloride, m-chloro benzoic acid chloride, p-chloro benzoic acid chloride, o-methoxy benzoic acid chloride, terephthalic acid dichloride, isoterephthalic acid dichloride, benzene sulfonic acid chloride, o-toluene sulfonic acid chloride, m-toluene sulfonic acid chloride, p-toluene sulfonic acid chloride, o-chlorobenzene sulfonic acid chloride, m-chlorobenzene sulfonic acid chloride, p-chlorobenzene sulfonic acid chloride, alpha-naphthalene sulfonic acid chloride and beta-naphthalene sulfonic acid chloride.

4,880,577

PROCESS FOR PRODUCING SELF-RESTORING OVER-CURRENT PROTECTIVE DEVICE BY GRAFTING METHOD

Kumakazu Okita, Chiba; Toshiaki Abe, Tokyo, and Masaru Kiriyama, Kanagawa, all of Japan, assignors to Daito Communication Apparatus Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,333

Claims priority, application Japan, Jul. 24, 1987, 62-184997

Int. Cl.[4] B29C *35/08*

U.S. Cl. 264—22 **5 Claims**

1. A process for producing a self-restoring overcurrent protective device by the grafting method characterized by comprising the steps of adding a suitable amount of organic peroxide as a reaction catalyst to a mixture consisting of colloidal graphite, at least one kind of carbon black selected from among acetylene black, Ketjen black and furnace black having a high structure, and one or more kinds of crystalline polymer substances, heating the mixture at a temperature higher than the thermal decomposition temperature of the organic peroxide so as to have a high viscosity, forcibly milling the mixture, whereby the organic peroxide is reacted with the polymer substance to give unpaired electrons to the polymer substance

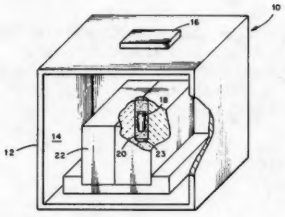
to thereby form polymer radicals, grafting the formed polymer radicals onto said graphite and carbon black to form a milled mass wherein the grafting products having such a structure that said polymer substance is combined with said graphite and carbon black are homogeneously dispersed in the form of primary particles in said polymer substance, molding the milled mass having a thermoplasticity into a predetermined shape, and thermally decomposing said organic peroxide not involved in the formation of said polymer radicals to add a cross-linking structure between said grafting products and polymer substance.

4,880,578

METHOD FOR HEAT TREATING AND SINTERING METAL OXIDES WITH MICROWAVE RADIATION

Cressie E. Holcombe, Farragut; Norman L. Dykes, Oak Ridge, and Thomas T. Meek, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 8, 1988, Ser. No. 229,892
Int. Cl.[4] C04B *35/64*
U.S. Cl. 264—26 **10 Claims**



1. A method for sintering together particulates of oxide material with microwave radiation comprising the steps of enclosing a compact of the particulates in housing means formed of zirconia, hafnia or a combination thereof and characterized by coupling with microwave radiation at temperatures lower than the microwave radiation coupling temperature of the particulates forming the compact, subjecting the housing means to microwave radiation for heating the housing means and the compact enclosed therein by heat transference from the housing means to raise the compact to a temperature at least adequate to initiate coupling of the particulate material forming the compact with microwave radiation and for providing thermal insulation about the compact for retaining within the housing means heat given off by the compact during the coupling thereof with microwave radiation, and subjecting the housing means and the compact enclosed therein to the microwave radiation for a sufficient duration to heat said compact to a temperature adequate for the sintering the particulates forming the compact.

4,880,579

METHOD FOR CLOSING OPENINGS OF THROUGH-HOLES IN A PIPE WALL

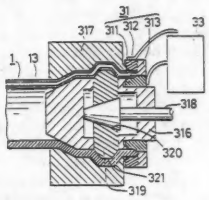
Masahiro Murata, Youkaichi, and Kaoru Takahashi, Ohtsu, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaku, Japan

Continuation of Ser. No. 910,473, Sep. 23, 1986, abandoned. This application Feb. 18, 1988, Ser. No. 159,436
Int. Cl.[4] B29C *57/00, 57/04*
U.S. Cl. 264—26 **5 Claims**

1. A method for closing the opening of each of the through-holes formed in the pipe-wall of a resin pipe and which extend parallel to the axis of said pipe, are partitioned from each other by hole-partition walls and are open at one end, said pipe-wall including an inner wall portion and an outer wall portion, aid method comprising the steps of:

heating and softening one end portion of said pipe,

pressing said end portion in the direction parallel to said axis in a first mold in such a manner that said end portion is positioned between inner and outer molds of said first mold and that the tip of said end portion extends from said first mold toward a second mold, by a certain length said first mold including inner and outer molds disposed coaxially with said resin pipe for holding the inner and outer walls of the pipe therebetween and said second mold being connected to a high frequency current source, and said



length of said tip area of said pipe being slightly greater than the depth of a cavity of said second mold into which said tip of said pipe enters,

diametrically enlarging a portion of said inner mold and said pipe,

clamping said pipe walls by the outer mold of said first mold, and

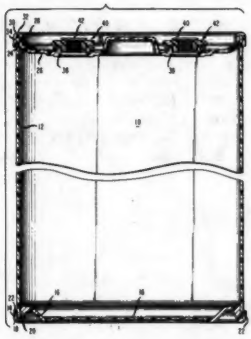
heating aid end portion by applying a high frequency current to said second mold and forcing said second mold into contact with the end portion of said pipe while the high frequency current is being applied to said second mold so as to melt said hole-partition walls, thereby closing each of said open ends of said through-holes.

4,880,580

REUSABLE PLASTIC DRUM CONTAINER ASSEMBLY AND PROCESS FOR REFITTING SUCH PLASTIC DRUM CONTAINER ASSEMBLY

Robert B. Bowers, Park Ridge, and Mark Chookazian, Paramus, both of N.J., assignors to Ashland Oil, Inc., Russell, Ky.

Filed Dec. 3, 1987, Ser. No. 128,030
Int. Cl.[4] B29C *35/12*
U.S. Cl. 264—26 **14 Claims**



1. In a process for assembling a plastic drum container assembly including a drum shell and top and bottom closure members affixed to said drum shell, the steps comprising:

(a) positioning a fitting-receiving member and a thermoplastic electromagnetic material about a neck member formed on said top closure member, said neck member comprised of a cylindrically-shaped portion extending upwardly from said top closure member and formed with an indentation portion in a surface thereof, said fitting-receiving member formed with a circularly-shaped channel for positioning said neck member therein, said thermoplastic electromagnetic material being disposed within said channel of said fitting-receiving member;

(b) establishing a electromagnetic field about said thermoplastic electromagnetic material for a time sufficient to melt said thermoplastic electromagnetic material; and

(c) placing a downward force on said fitting-receiving member to cause said neck member of said top closure member to extend into said channel of said fitting-receiving member including molten thermoplastic electromagnetic material thereby to mount said fitting-receiving member to said top closure member.

8. A process for refurbishing a plastic drum container assembly including a drum shell and top and bottom closure members affixed to said drum shell and wherein said top closure member includes a fitting-receiving member including a fitting orifice affixed to a neck member formed on said top closure member by a thermoplastic electromagnetic material, the steps comprising:

(a) inserting a retraction member into said fitting orifice of said fitting-receiving member to engage said fitting-receiving member;

(b) establishing an electromagnetic field about said fitting-receiving member affixed to said neck member for a time sufficient to melt said thermoplastic electromagnetic material;

(c) withdrawing said retraction member including said fitting-receiving member from said neck member of said top closure member;

(d) refurbishing said drum shell;

(e) positioning a new fitting-receiving member including a thermoplastic electromagnetic material about said neck member of said top closure member;

(f) establishing an electromagnetic field about said fitting-receiving member affixed to said neck member for a time sufficient to melt said thermoplastic electromagnetic material; and

(g) placing a downward force on said fitting-receiving member to cause said neck member of said top closure member to extend into said channel of said fitting-receiving member including molten thermoplastic electromagnetic material thereby to mount said fitting-receiving member to said top closure member.

4,880,581

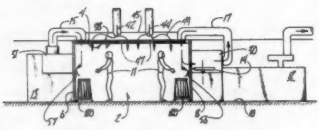
MEANS AND METHOD FOR ASEPTIC PARTICLE-FREE PRODUCTION OF ARTICLES

Frank R. Dastoli, Arlington; Bernard Z. Senkowski, Fort Worth; Dieter W. Wagener, Fort Worth; George H. Bogdanffy, Fort Worth, and Gaurang R. Vin, Arlington, all of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 24, 1986, Ser. No. 946,342

Int. Cl.[4] B29C *33/10, 49/46, 49/62;* F24F *7/10*

U.S. Cl. 264—39 **23 Claims**



1. A method of aseptic, particle-free production of interiors and exteriors of articles, to avoid the need for chemical or irradiation treatment of the articles, and to provide aseptic articles which are prepared for further processing, comprising the steps of:

creating an aseptic environment within a clean room;

shrouding at least a portion of an article producing means of a production machine to substantially segregate the portion of the article producing means from the clean room but retaining some communication with the clean room;

substantially isolating the portion of the article producing means which is shrouded from any external environment and from the clean room;

sterilizing the interior of the clean room, the portion of the article producing means within the shroud, the interior of the shroud, and any surfaces of the shroud inside and communicating with the clean room;

filtering and sterilizing any air enclosed by the clean room and the shroud; and

imparting a flow of filtered, sterilized air through the clean room and into the shroud, over and around the articles being produced on the portion of the article producing means within the shroud, and out of the shroud, so that the articles produced will be aseptic interiorally and exteriorally and ready for further processing.

4,880,582

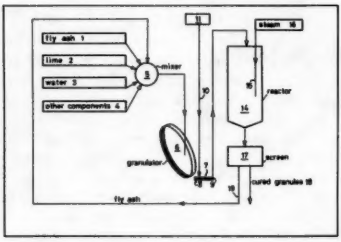
HARDENING GRANULATED MATERIAL AT ELEVATED TEMPERATURES

Jacobs J. Spanjer, Nunspeet, and Pieter D. Rademaker, Haarlem, both of Netherlands, assignors to Aardelite Holding B. V., Netherlands

Filed Jul. 22, 1987, Ser. No. 76,313

Int. Cl.[4] B29B *9/16*

U.S. Cl. 264—82 **9 Claims**



1. A process of manufacturing hardened granules produced by mixing at least fly ash obtained from combustion of a material selected from the group consisting of a coal product and lignite, a binder and water, forming granules of said mixture, hardening said granules in an embedding material at a temperature between 85° and 212° F. by applying heat and separating the hardened granules from the embedding material, comprising the step of feeding fine grained embedding material and granules to be cured into a hardening reactor and

embedding the granules in said hardening reactor in said fine grained embedding material with a water absorption capacity of at least 10% and being free from a compound generating heat by contacting water and supplying heat to the mixture of granules and embedding material in said hardening reactor by introducing steam into the mixture of granules and embedding material as present in the hardening reactor to raise and maintain the temperature at a value between 85° and 212° F., the ratio between the quantity of embedding material and granules being between 0.2 and 1, said steam introduced into said hardening reactor condensing on said embedding material, wherein the pH of the moist embedding material is above 4, and the heat generated said condensation being transferred to the

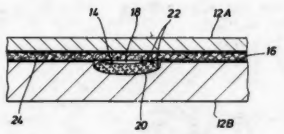
granules by conduction, thus reducing the hardening time for curing the granules to a certain strength.

4,880,583

METHOD FOR REDUCTION OF MOLD CYCLE TIME

Paul I. Douglas, Woodlands, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 23, 1988, Ser. No. 197,738
Int. Cl.[4] B29C *45/56, 33/42, 33/56*
U.S. Cl. 264—130 **6 Claims**



1. A method for reducing the fabrication time of a molded article of manufacture wherein a portion of said molded article is formed by a hardenable liquid, said method including the steps of:

providing a mold having two mold section surfaces with at least one of said surfaces having one hardenable liquid injection port defined therethrough, at least one of said mold section surfaces having at least one channel with an associated channel surface and channel opening defined relative to said mold surface,

providing a heat-recoverable member, said member previously having been deformed under heat and/or pressure from an expanded first configuration to a compressed second configuration, said member when subjected to a suitable temperature of recovery capable of recovering to or towards its expanded first configuration,

locating said heat recoverable member within a portion of said channel,

flowing said hardenable liquid into said mold,

heating said heat recoverable member at least to said suitable temperature of recovery, thereby expanding said heat recoverable member to said first configuration within said channel,

retaining said hardenable liquid in said mold for a sufficient period for said liquid to harden sufficiently to dimensionally stabilize said article of manufacture, and

removing said article of manufacture from said mold.

4,880,584

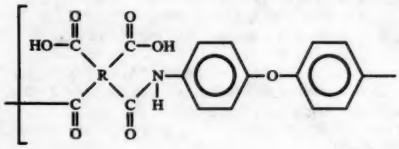
FIBER REINFORCED THERMOPLASTIC RESIN MATRIX COMPOSITES

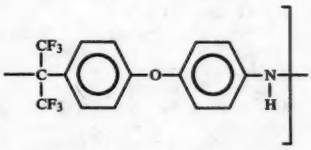
Robert J. Jones, Torrance, and Glenn E. C. Chang, Redondo Beach, both of Calif., assignors to TRW, Inc., Redondo Beach, Calif.

Division of Ser. No. 855,939, Apr. 25, 1986. This application Jul. 25, 1988, Ser. No. 223,613
Int. Cl.[4] B29C *43/20*
U.S. Cl. 264—135 **6 Claims**

1. A process of forming a fiber-reinforced composite which comprises

(a) forming a prepreg thermoplastic lay-up made of a stack of plies composed of a (i) thermoplastic polyimide resin prepared from the imidization of a polyamic acid of the formula





where R is an organic group of 5 to 22 carbon atoms which may be an aliphatic radical, including alicyclic, or an aromatic radical having one or more benzene or fused polynuclear rings and (ii) continuous reinforcing fibers, the composite having from 10 to 50 parts by weight of said resin and from 90 to 50 parts by weight of said fibers;

(b) compression molding said thermoplastic polyimide lay-up by applying thereto progressively increased pressure and temperature in stages;

(c) cooling said compression molded thermoplastic polyimide lay-up while under pressure;

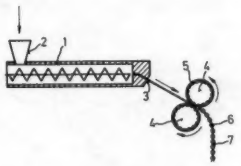
(d) heating the lay-up resulting from step (c) while unrestrained in air at a temperature of at least 700° F.

4,880,585

CONTINUOUS METHOD OF TABLETING

Roger G. Klimesch, Alsbach/Haehnlein; Gerhard Bleckmann, Lampertheim; Karl-Peter Farwerck, Worms; Hans-Helmut Goertz, Freinsheim, and Lothar Schlemmer, Maxdorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 34,939, Apr. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 923,870, Oct. 28, 1986, abandoned. This application Dec. 22, 1988, Ser. No. 289,407
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612211
Int. Cl.[4] A61K *9/20*; B29C *43/02, 47/00*
U.S. Cl. 264—141 **3 Claims**



1. A continuous method for producing separate tablets of an extrudable pharmaceutical mixture which comprises:

mixing a pharmaceutically active compound and an N-vinylpyrrolid-2-one (NVP) polymer containing 30 to 100% by weight NVP in an extruder to form a melt, said polymer having a K value of from 10 to 100, said mixture having a glass transition point of less than 180° C.;

extruding the melt and pressing the still deformable extrudate between the surfaces of two rollers driven in opposite directions, the surfaces of said rollers having opposed depressions, whereby, separate tablets having the shape of the opposed depressions are formed.

4,880,586

METHOD FOR THE TREATMENT OF ANIMAL EXCREMENTS AND SEWAGE SLUDGES

Wolfgang Baader, Bundesallee 50, 3300 Braunschweig, Fed. Rep. of Germany

Continuation of Ser. No. 346,608, Feb. 8, 1982, abandoned, which is a continuation of Ser. No. 875,088, Feb. 3, 1978, abandoned. This application Sep. 16, 1983, Ser. No. 533,152

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705098

Int. Cl.[4] C05F *3/06*

U.S. Cl. 264—141 **4 Claims**

1. A method of biologically treating natural waste material to form substantially odorless and germ-free solid briquettes of treated waste material, wherein the natural waste material has a relatively high moisture content and includes a natural organic waste substance, said method comprising the steps of:

(a) adjusting the moisture content of said natural waste material to a maximum of 60%;

(b) forming said waste material which has been adjusted for moisture content into briquettes having volumes predominantly in the range of 30 cm^3 to 50 cm^3;

(c) loosely positioning said briquettes in heaps permeable by air without artifical circulation; and

(d) leaving said briquettes exposed to said air without artifical circulation thereof to effect a spontaneously starting, exothermic, biological ripening of said mixture wherein the heat of said ripening produces natural circulation of air through said heaps in order to supply oxygen to said briquettes in quantities sufficient to achieve a self-sustaining oxygen-fed ripening reaction, whereby said briquettes are naturally converted into substantially odorless and germ-free briquettes of treated waste material.

4,880,587

PROCESS FOR PRODUCTION OF AN INJECTED MOLDED PART

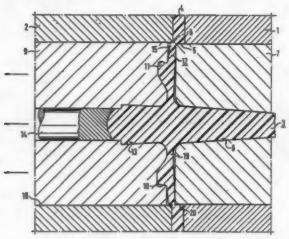
Martin Fichlseder, Ottenberg, and Ingo Preuss, Munich, both of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Munich, Fed. Rep. of Germany

Division of Ser. No. 889,249, Jul. 25, 1986, Pat. No. 4,738,613. This application Jan. 13, 1988, Ser. No. 143,183

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526632

Int. Cl.[4] B29C *45/44*

U.S. Cl. 264—154 **6 Claims**



1. A method for producing apertured injection molded parts utilizing an injection molding tool having a center busing arranged within a stationary half partially defined a mold cavity and an axially aligned sleeve arranged within a displaceable half partially defining said mold cavity comprising the steps of:

closing the injection molding tool so that the center bushing and the sleeve define a sprue cavity integral to said mold cavity defined by said stationary half and said displaceable half, said sprue cavity is offset along an axis and integral with said mold cavity;

injecting material into said mold cavity through a sprue funnel defined by said bushing and said sprue cavity;

separating a sprue internally formed with a molded part and joined to said molded part at an aperture partially defined by an extension of said bushing past said stationary half by axial retraction of said sleeve.

4,880,588

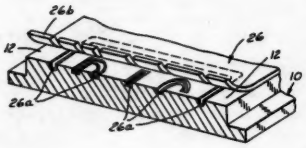
METHOD FOR PRODUCING A MOLDED ARTICLE HAVING COLORED FEATURES

Alfred F. Brault, South Berwick, Me., and John D. Gray, New Durham, N.H., assignors to Davidson Textron Inc., Dover, N.H.

Continuation-in-part of Ser. No. 74,354, Jul. 16, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 232,624

Int. Cl.[4] B28B *7/14*; B29C *39/12, 41/08, 41/18*

U.S. Cl. 264—163 **9 Claims**



1. In a process for forming a decorative feature in situ in a base layer of a plastic shell made from thermoplastic material cast against a heated tool having a mold surface thereon the improvement comprising:

forming a recessed surface on the mold surface corresponding to the desired decorative feature;

providing a sharp breakline between the recessed surface and the mold surface;

heating the mold surface;

depositing a first layer of thermoplastic material on the mold surface and the recessed surface therein to provide a covering thereon and melting the covering into the recessed surface while simultaneously forming a thin membrane on the mold surface;

cooling the covering including the thin membrane and lifting the thin membrane from the mold surface while separating the thin membrane from the material retained in the recessed surface which corresponds to the desired decorative feature, at the sharp breakline;

reheating the tool to partially remelt the material retained in the recessed surface;

depositing a base layer of thermoplastic material across the surface of the mold and bonding it to the partially remelted material retained in the recessed surface;

cooling and stripping the bonded thermoplastic material from the mold surface so as to form the shell with the decorative feature defined by the material which was retained in the recessed surface and which was then formed in situ in the base layer of thermoplastic material.

4,880,589

PROCESS OF MAKING A NON-ORIENTED, SURFACE-ROUGHENED FILM OR SHEET

Hiromi Shigemoto, Iwakuni; Shunji Abe, Tokyo, and Akio Yamamoto, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 892,043, Aug. 1, 1986, Pat. No. 4,777,201. This application Jun. 21, 1988, Ser. No. 219,757

Claims priority, application Japan, Aug. 2, 1985, 60-170875

Int. Cl.[4] B29C *43/20, 59/04*; B32B *31/22*

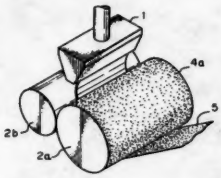
U.S. Cl. 264—216 **5 Claims**

1. A process for production of an essentially non-oriented surface-roughened film or sheet comprising a crystalline ho-

mopolymer or crystalline copolymer of 4-methyl-1-pentene having a surface roughness of 0.5 to 10 micrometers, said process comprising the following steps:

(1) preparing a molten composition comprising a homopolymer or copolymer of 4-methyl-1-pentene wherein the polymer comprises at least 85 molar percent of the 4-methyl-1-pentene unit;

(2) extruding the molten composition to form a film or sheet; and



(3) placing the film or sheet in contact with a roll having a roughened surface or passing the film or sheet through a pair of rollers, at least one of which rollers has a roughened surface wherein the surface roughness of the roughened roller is 0.5 to 10 micrometers, at a pressure and a temperature such that the roughness of the surface of the roll is replicated on the surface of the film or sheet.

4,880,590

PROCESS FOR PRODUCING ROLLERS EQUIPPED WITH A RUBBER LAYER

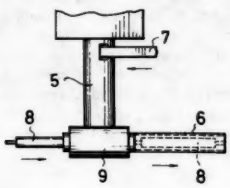
Akira Furuya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1987, Ser. No. 55,059

Claims priority, application Japan, Jun. 4, 1986, 61-128003

Int. Cl.[4] B29C *47/02*

U.S. Cl. 264—275 **7 Claims**



1. A process for producing a roller equipped with a rubber layer, comprising the steps of:

coating the circumferential wall of a core metal with a rubber material in a coating apparatus,

inserting the core metal coated with the rubber material into a cylindrical mold connected to the coating apparatus,

removing the mold containing the core metal coated with the rubber material from the coating apparatus, and

then subjecting the mold to a heating treatment.

4,880,591

METHOD FOR MANUFACTURING SPEAKER VIBRATION MEMBER

Fumiaki Baba, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 178,009

Int. Cl.[4] B29C *35/00*

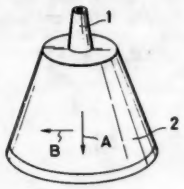
U.S. Cl. 264—327 **7 Claims**

1. A method for manufacturing a speaker vibration member in a molding process, said method comprising:

a first step of preparing a mixture of materials for forming said speaker member, said mixture of materials containing no less than 10% by weight of liquid crystal polymer and 3 to 40% by weight of fiber or flake filler,

a second step of melting the mixture of liquid crystal polymer and fiber or flake filler materials,

a third step of introducing the mixture into a mold, said mold being maintained at a lower temperature than a solidified temperature of said mixture of materials, and



a fourth step of cooling and solidifying the melted mixture materials as the mixture flows in said mold which is adjusted at said lower temperature than the solidification temperature of the materials so that orientation of the mixture materials in the center layers of said molded speaker vibration member is increased for increasing the elasticity coefficient of said vibration member by increasing the shear flow rate and decreasing the mold temperature.

4,880,592

MANUFACTURE OF POLYMERIC PRODUCTS

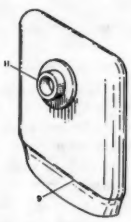
Francesco Martini, Milan; Luigi Perazzo, Cuneo, and Paolo Vietto, Milan, all of Italy, assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Dec. 8, 1986, Ser. No. 939,375

Claims priority, application United Kingdom, Dec. 9, 1985, 8530324; Dec. 9, 1985, 8530325; Dec. 9, 1985, 8530326; Dec. 9, 1985, 8530327; Dec. 9, 1985, 8530328; Dec. 9, 1985, 8530329

Int. Cl.[4] B29C *47/06*

U.S. Cl. 264—514 **4 Claims**



1. A method of making a sheet material comprising melt extruding a laminated tube of a tubular layer of HB polymer composition in molten form and a tubular layer of molten thermoplastic that is substantially non-tacky on solidification, and stretching and solidifying the extruded laminate, wherein the HB polymer is a biodegradable polymer formed of recurring units of which 50 to 100% molar are units of formula 1

$$—OC_nH_{2n}CO—$$

where n is 3, 4 or 5 and the HB polymer composition comprises 50 to 100% of the HB polymer and 0 to 50% diluent additive, the layer of HB polymer composition is to a thickness of 5 to 200 um and the layer of HB polymer composition has moisture vapor transmission of 30 to 200 g/25 um.m^2.day at 38° C. and

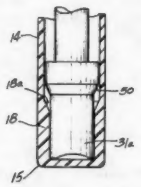
has an oxygen transmission value of 10 to 200 cc/25 um.m^2.day.bar at 23° C.

4,880,593

METHOD FOR PREPARING BLOW MOLDED PLASTIC CONTAINER

Herbert Strassheimer, Windermere, Fla., assignor to Plasticon Patents, S.A., Geneva, Switzerland

Filed Jan. 11, 1988, Ser. No. 142,004
Int. Cl.[4] B29C *49/12*
U.S. Cl. 264—532 5 Claims



1. A method of preparing a blow molded plastic container having a neck portion defining an opening, a tubular body portion depending therefrom and an integral bottom structure depending from the tubular body portion, said method comprising:

providing a plastic preform for forming the blow molded plastic container said preform having a neck portion defining an opening, a tubular body portion depending therefrom and an integral bottom structure depending from the tubular body portion, said integral bottom structure having a closed bottom end;

providing a stretch rod having an enlarged base portion; placing the preform inside a blow mold and inserting the stretch rod inside the preform such that a bottom of the stretch rod contacts an inside surface of said closed bottom end of said preform and stretching said preform with said rod and blowing said preform into the configuration of said mold;

wherein the enlarged base portion of said rod is adapted to effect stretching of said integral bottom structure and preliminarily stretches said integral bottom structure and said tubular body portion simultaneous in different amounts to obtain in said integral bottom structure continuous variations of thickness having thick parts thereof which are thicker than an average wall thickness of said tubular body portion of said blow molded plastic container; said enlarged base portion of said rod stretches said integral bottom structure of said preform by means of a controlled stroke in an amount less than the amount of stretching of the tubular body portion of said preform to obtain bi-axial orientation in said container upon blowing of said preform, said bi-axial orientation being achieved in a region extending well beyond a central region of the bottom of said blow molded container; said preform having an inside and an outside wall face, and the body portion of said preform adjacent said bottom structure has a thickened inside wall face with an abutment at its transition to the tubular body portion;

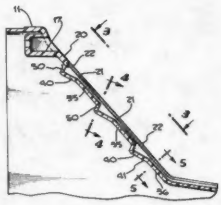
said method further including the step of contacting a corresponding portion of the stretch rod with said abutment after said preliminary stretching of said tubular body portion and said integral botttom structure to thereby keep the stretch rod from further stretching the integral bottom structure while continuing to stretch the tubular body portion of said preform.

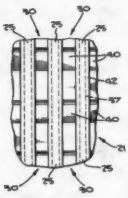
4,880,594

VENTILATED, NO-DRIP, HOUSING FOR ELECTRICAL APPARATUS

Cheun-Yuan Fu, Cerritos, Calif., assignor to Tatung Company of America, Long Beach, Calif.

Filed Jun. 20, 1988, Ser. No. 208,589
Int. Cl.[4] H04N *5/64;* F24F *13/08*
U.S. Cl. 361—383 5 Claims





4. A housing for an electrical apparatus, which is an integrally formed plastic member having a sloping wall with a plurality of sloping-trough depressed areas formed therein, the upper extremity of each said sloping-trough depressed area being deepened so as to have a discontinuity relative to the adjacent wall portion, thereby forming an opening for the escape of warm air from inside the housing, and the wall sloping in one direction relative to the vertical while the open face of each discontinuity-formed opening slopes in the opposite direction so that liquid falling upon the sloping wall tends not to enter the openings but instead to flow downward along and off the exterior surface of the housing.

4,880,595

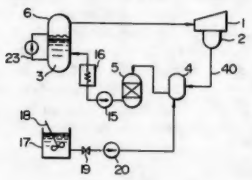
PROCESS AND APPARATUS FOR CLEANING NUCLEAR REACTOR COOLING WATER

Masami Matsuda, Hitachi; Kiyomi Funabashi, Katsuta; Takashi Nishi, Hitachi; Itaru Komori, Katsuta; Tsutomu Baba, Katsuta; Hideo Yusa, Katsuta; Shunsuke Uchida, Hitachi; Tetsuro Adachi, Katsuta; Katsumi Ohsumi, Hitachi, and Tomohiro Sato, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 883,524, Jul. 8, 1986, abandoned. This application Jan. 27, 1989, Ser. No. 303,055
Claims priority, application Japan, Jul. 10, 1985, 150251
Int. Cl.[4] G21C *19/42;* C02F *1/42;* C21F *9/08*
U.S. Cl. 376—313 4 Claims

1. A process for cleaning nuclear reactor cooling water, which comprises contacting nuclear reactor cooling water with an ion exchange resin mixture of (a) 50 to 90% by weight of a cation exchange carboxylic acid-based resin having an average particle size of 30 to 60 μm, and (b) 10 to 50% by weight of anion exchange resin, said mixture being reinforced with 10 to 40% by weight of reinforcing fibers on a dry basis of total weight of said resins and said fibers, thereby trapping

cruds or cations in the cooling water; wherein the cation exchange carboxylic acid-based resin is a straight chain type ion



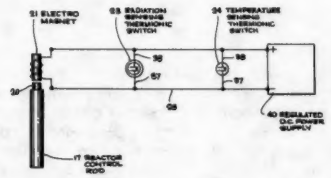
exchange resin whose ion-exchange groups are bonded to other elements than carbon atoms constituting a benzene ring.

4,880,596

THERMIONIC SWITCHED SELF-ACTUATING REACTOR SHUTDOWN SYSTEM

Donald M. Barrus; Charles D. Shires, both of San Jose, and William A. Brummond, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 270,682, Jun. 4, 1981, abandoned. This application Nov. 13, 1987, Ser. No. 120,710
Int. Cl.[4] G21C 7/12
U.S. Cl. 376—336 22 Claims



1. In a reactor control assembly utilizing electromagnetic means for retaining a control element in ready position for insertion into a reactor core containing a plurality of fuel assemblies having coolant flowing therethrough, the improvement comprising:

first means responsive to temperature of reactor coolant passing through said fuel assemblies for releasing said control element, said first means including a quantity of thermionic material which changes from a high electrical resistance to a low electrical resistance upon an increase in reactor coolant temperature above a selected temperature;

second means responsive to reactor neutron flux for releasing said control element, said second means including a quantity of material which is heated by neutron flux and a quantity of thermionic material that changes from a high electrical resistance to a low electrical resistance upon an increase in temperature above a selected temperature, said thermionic material being heated by the heating of said first-mentioned material by neutron flux; and

an electrical circuit interconnecting a power source with said electromagnetic means, said first and second means being connected to said electrical circuit so as to be electrically in paralllel with said electromagnetic means;

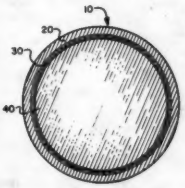
whereby under normal operating conditions electrical current flows from said power source to said electromagnetic means, and activation of either of said first means or said second means causes electrical current flowing to said electromagnetic means to be short-circuited resulting in release of said control element from said electromagnetic means for insertion of said control element into said reactor core.

4,880,597

ALLOY COATED FUEL CLADDING

William J. Bryan, Granby, and Nathan Fuhrman, Plainville, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 81,969, Aug. 5, 1987, Pat. No. 4,824,634. This application Jun. 24, 1988, Ser. No. 213,567
Int. Cl.[4] G21C 3/00
U.S. Cl. 376—419 4 Claims



1. In a fuel element for use in a nuclear reactor which includes a fissionable material contained within a zirconium-alloy cladding tube, the improvement which comprises:

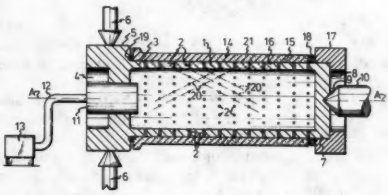
a coating on the inside of the zirconium-alloy cladding tube, said coating including a nickel-thallium-boron burnable poison compound.

4,880,598

METHOD FOR MANUFACTURING A TUBULAR COMPACT

Flemming Hansen Kaad, and Ola Pettersson, both of Höganäs, Sweden, assignors to Cips KB, Höganäs, Sweden

Filed Dec. 15, 1988, Ser. No. 284,562
Claims priority, application Sweden, Dec. 18, 1987, 8705053
Int. Cl.[4] G22F 7/00
U.S. Cl. 419—1 11 Claims



1. A method of handling a tubular compact formed by compacting a powder into a tubular shape, comprising the steps of fitting a circumferential surface of the compact to a complementary abutment surface with a slight clearance space therebetween, and evacuating said clearance space such that the compact bridges said space and is drawn into firm retention against said abutment surface.

4,880,599

METHOD OF MAKING A FERRITE COMPOSITE CONTAINING SILVER METALLIZATION

Richard J. Charles, Schenectady, and Achuta R. Gaddipati, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1988, Ser. No. 172,834
Int. Cl.[4] B22F 7/00
U.S. Cl. 419—6 14 Claims

1. A process for producing a solid composite comprised of a ferrite matrix containing a continuous silver metallization with

only its end portions exposed to the ambient, said ferrite matrix having an electrical resistivity greater than 500 ohm-centimeters at a temperature ranging from about 20° C. to about 100° C., which comprises:

(a) providing a ferrite powder;

(b) admixing said ferrite powder with an organic binding material;

(c) forming the resulting mixture into tape;

(d) providing a silver metallization-forming material;

(e) forming a layered structure of at least two of said tapes containing said silver metallization-forming material therewithin in a pattern with two end portions, said metallization-forming material being present in an amount sufficient to produce said silver metallization;

(f) laminating the layered structure and forming a laminated structure wherein only said end portions of said pattern are exposed;

(g) firing said laminated structure to thermally decompose its organic component at an elevated temperature below about 600° C. leaving no significant deleterious residue, said firing being carried out in an atmosphere or vacuum which has no significant deleterious effect on said composite;

(h) sintering the resulting structure at a temperature ranging from about 1000° C. to about 1400° C. in an oxygen-containing atmosphere to produce a sintered product having the composition of said composite; and

(i) cooling said sintered product to produce said composite, said sintering and cooling being carried out in an atmosphere which has no significant deleterious effect on said composite, said ferrite powder having a composition which forms said ferrite matrix in said process.

4,880,600

METHOD OF MAKING AND USING A TITANIUM DIBORIDE COMPRISING BODY

David Moskowitz, Southfield, and Charles W. Phillips, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 515,028, May 27, 1983, abandoned. This application Nov. 20, 1987, Ser. No. 124,383

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—12 **6 Claims**

1. Method of making a high strength, high density titanium diboride comprising body, useful when shaped as a cutting tool, by the steps comprising:

(a) compacting a powder mixture milled to an absolute maximum particle size of 5 microns or less, said mixture consisting of 5–10% by weight of a binder selected from the group consisting of cobalt, nickel and iron, and the remainder being essentially titanium diboride, except for up to 1.0% oxygen and up to 2% graphite, said mixture being formed into a body of less than required density; and

(b) sintering said compact by heating to a temperature of at least 1500° sufficient to densify said compact to at least 97% of full theoretical density, to form a heat fused product exhibiting a hardness of at least 90 Rockwell A and a transverse rupture strength of at least 100,000 psi.

4,880,601

HYDROGEN PEROXIDE DISINFECTING SYSTEM FOR CONTACT LENSES

Guy Andermann, Strasbourg; Joseph Spittler, Kayersberg; Patricia Zilliox, Strasbourg, and Dominique Mergel, Sigolsheim, all of France, assignors to Laboratoires, P.O.S., Kayserberg, France

Filed Sep. 27, 1985, Ser. No. 781,286

Int. Cl.[4] A61L *2/16*

U.S. Cl. 422—28 **6 Claims**

1. A method of disinfecting a contact lens, comprising:

soaking the lens in an aqueous sterilizing solution containing an amount of hydrogen peroxide effective to sterilize the lens and a hydrogen peroxide stabilizing agent, said stabilizing agent consisting essentially of sodium stannate at a concentration of about 10 to 100 parts per million, thereby sterilizing the lens; and

contacting the sterilized lens with an aqueous neutralizing solution containing an amount of sodium thiosulfate effective to neutralize substantially all of the hydrogen peroxide present in and on the lens following treatment with the disinfecting solution and an amount of a tin complexing agent effective to sequester substantially all of the tin introduced into the neutralizing solution by the sterilized lens, said neutralizing solution having a pH of about 7.

4,880,602

METHOD AND DEVICE FOR DISINFECTING BIOLOGICAL FLUIDS AND CONTAINER FOR SAME

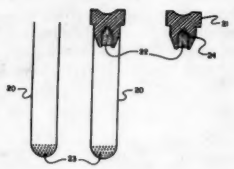
Habib Al-Sioufi, P.O. Box 654, Brookline, Mass. 02146

Continuation-in-part of Ser. No. 780,668, Sep. 29, 1989, Pat. No. 4,675,159. This application Jun. 5, 1987, Ser. No. 58,553

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] A61L *2/18*

U.S. Cl. 422—28 **22 Claims**



1. A biological fluid disinfecting device comprising an evacuated receptacle for holding a specimen of biological fluid for clinical evaluation which is closed at one of its ends by an elastomeric stopper adapted to be penetrated by means for introducing said specimen therein, said receptacle also containing prior to introduction of said specimen about 0.001 to 5.0 weight percent based on the total fluid of a disinfectant for viral infection present in the specimen which disinfectant is one or more compounds or mixtures thereof selected from the group consisting of glutaraldehyde, formaldehyde, chlorohexidine, phenols and guaternary ammonium compounds.

21. A method for destroying viral contamination in specimens of biological fluids which comprises providing an evacuated container for said fluids having predisposed therein about 0.001 to 5.0 weight percent of a disinfectant for said viral contamination selected from the group consisting of glutaraldehyde, formaldehyde, chlorhexidine, phenols and quaternary ammonium compounds or mixtures thereof, said disinfectant being buffered substantially at the time said biological fluid is introduced therein to a pH of about 7.2 to 8.5.

4,880,603

DEVICE FOR ACHIEVING A UNIFORM DISTRIBUTION OF THE GAS FLOWING RADIALLY THROUGH A CATALYST BED

Friedrich Förster, Dortmund, Fed. Rep. of Germany, assignor to UHDE GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 718,487, Apr. 1, 1985, abandoned. This application Feb. 8, 1988, Ser. No. 154,524

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413421

Int. Cl.[4] B01J *8/02, 8/04*

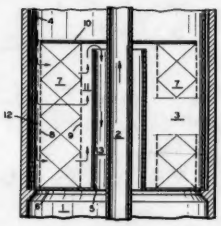
U.S. Cl. 422—218 **8 Claims**

1. A device for achieving a uniform distribution of the gas flowing radially through a catalyst bed in a reactor for catalytic reactions comprising:

an annular catalyst basket having gas-permeable inner and outer cylindrical walls each having a plurality of predeter-

mined diameter, uniformly distributed apertures formed therein, and a gastight cover;

an annular vessel having gastight inner and outer cylindrical walls, and a gastight bottom, said basket being positioned in said vessel between said inner and outer walls of said vessel, said vessel outer wall and said basket outer wall forming a first annular space, said vessel inner wall and said basket inner wall forming a second annular space; and



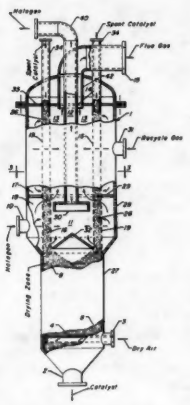
means for providing influent fresh gas in a first axial direction to said first annular space and means for receiving effluent reaction gas in a second opposite axial direction from said second annular space and wherein the cross-sectional area of said second annular space for the effluent reaction gas is equal to or larger than the cross-sectional area of said first annular space.

4,880,604

APPARATUS FOR COKE BURNING IN REGENERATION OF HYDROCARBON CONVERSION CATALYST

William J. Koves, Hoffman Estates, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 4, 1987, Ser. No. 116,932
Int. Cl.[4] B01J *8/12, 23/90*
U.S. Cl. 422—220 **7 Claims**



1. Apparatus for regenerating spent catalyst particles by the removal of coke in a burn zone, said apparatus comprising:

(a) a vessel;

(b) first and second vertically-extended catalyst screens disposed within said vessel and spaced apart by a uniform horizontal distance over the length of said screens to define a burn zone and confine catalyst particles in a vertically-elongated bed of catalyst particles that occupies said burn zone;

(c) means for adding catalyst particles to the top of said vertically-elongated bed and withdrawing catalyst particles from the bottom of said vertically-elongated bed to provide an at least intermittent downward gravity flow of catalyst particles through said vertically-extended bed;

(d) means for passing recycle gas into and collecting flue gas from said vertically-elongated bed in a direction transverse to the flow of catalyst particles and varying the gas flow rate over the vertical length of said vertically-elongated bed, said means for passing, collecting and varying including a recycle gas distribution space, defined in part by at least one of said vessel and said first screen, for distributing recycle gas over the surface of said first screen and a vertically-extended flue gas collection space, defined in part by at least one of said vessel and said second screen, for collecting flue gas from the surface of said second screen; and

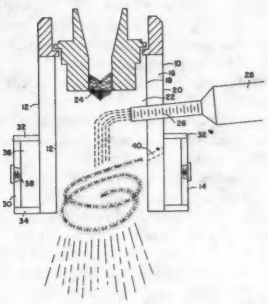
(e) a plurality of gas flow apertures in at least one of said first and second screens, said apertures providing at least a part of said means for varying the gas flow rate and said apertures having a maximum open area at the top of said vertically-extended bed and a minimum open area at the bottom of said vertically-extended bed, so that the maximum gas flow rate is at the top of the bed and the minimum gas flow rate is at the bottom of the bed.

4,880,605

GAS DISPERSION SHROUD FOR HIGH TEMPERATURE PROCESSING OF POWDERS

Nelson E. Kopatz, Sayre, Pa.; Philip E. Stermer, Waverly, N.J., and Lori S. Pruyne, Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,923
Int. Cl.[4] F27B *17/00*
U.S. Cl. 422—232 **2 Claims**



1. An apparatus for reacting a powder with a reacting gas, said apparatus comprising a shroud consisting essentially of a first section having a peripheral cylindrical wall with an inner surface and an outer surface, said inner surface defining a cavity which serves as a reaction chamber in which said powder and said reacting gas react, said first section being detatchably mounted at its top end to the exit nozzle of a high temperature source, said first section having one or more powder inlet openings extending through the thickness of said peripheral wall from said outer surface to said inner surface, thereby connecting the outside with said reaction chamber through which said powder enters said reaction chamber, said powder inlet openings being positioned sufficiently close to said exit nozzle to allow said powder to melt and to react with said reacting gas in the molten state, and a second section forming a cylindrical jacket skirting the lower part of said first section at a point below said powder inelt openings, said jacket having an outer peripheral wall, an inner wall which is one and the same with said peripheral wall of said first section, and top and bottom ring plates which form the top and bottom walls re-

spectively of said second section, said walls of said second section defining a plenum, said second section having one or more outer openings through the thickness of said outer peripheral wall of said jacket which connect the outside with said plenum through which said reacting gas enters from an outside source to said plenum, said second section having two or more inner openings through the thickness of said inner wall of said second section, which connect said plenum with said reaction chamber through which said reacting gas enters said reaction chamber from said plenum to react with said powder in said reaction chamber, said inner openings being directed downward into said reaction chamber and tangential to said inner surface of said shroud, with the resulting reaction product exiting said shroud through the bottom end of said reaction chamber.

4,880,606

METHOD AND APPARATUS FOR DESULFURIZATION OF SULFUR OR HYDROGEN SULFIDE-CONTAINING GASES

Lothar Görlich, Dissen a.T.W., Fed. Rep. of Germany, assignor to UTB Umwelttechnik Buchs AG, Buchs, Switzerland

Continuation-in-part of Ser. No. 188,742, Apr. 28, 1988. This application Jul. 21, 1988, Ser. No. 222,263

Claims priority, application Switzerland, Oct. 11, 1985, 4394/85

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[4] C01B *17/05*

U.S. Cl. 423—220 **20 Claims**

1. Method of desulfurization of gas contaminated with sulfur comprising the steps of

providing a reservoir (27; 31, 33) of washing or scrubbing liquid;

feeding said contaminated gas through an absorber (11) while simultaneously circulating a portion of said washing liquid at a first flow rate in a first loop comprising a scrubbing loop including a recirculating stream from said reservoir (27, 31) through said absorber (11) and back into said reservoir, thereby forming contaminated liquid including sulfur compounds;

circulating a portion of said contaminated washing liquid from said reservoir at a second flow rate in a second loop comprising regenerating loop including a recirculating stream from the reservoir (27; 33) to a regenerator (59) and back to the reservoir,

wherein said second flow rate exceeds said first flow rate,

thereby oxidizing said sulfur compounds to form elemental sulfur, removing said elemental sulfur from said liquid, and thereafter circulating said liquid back into said reservoir, and wherein said oxidizing includes aerating the contaminated washing liquid in the regenerator with an oxygen-containing gas.

4,880,607

RECOVERING MINERAL VALUES FROM ORES

Robert L. Horton, Chagrin Falls, Ohio, and George V. Lakey, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1982, Ser. No. 451,300

Int. Cl.[4] C22B *60/02*; C01G *43/01*

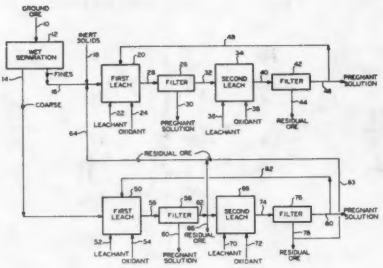
U.S. Cl. 423—20 **18 Claims**

1. A method for recovering uranium values from ground uranium-containing ore, comprising:

(a) separating said ore into coarse and fines fractions;

(b) adding to said fines fraction a diluent solid material, selected from the group consisting of (1) inert solids, (2) a barren part of said coarse fraction produced by leaching said coarse fraction to recover uranium therefrom to its economic or practical limit, and (3) a barren part of said coarse fraction produced by roasting said coarse fraction to recover uranium therefrom to its economic or practical limit, said diluent material having a particle size roughly equivalent to the particle size of said coarse fraction;

(c) contacting the mixture of said fines fraction and said diluent solid material with a first leachant selected from the group consisting of (1) an aqueous alkaline solution



containing an oxidant and (2) an aqueous acidic solution containing an oxidant, adapted to solvate a significant amount of said uranium values, in at least one mixed fines/diluent solid leaching step; and

(d) separating a pregnant leach solution, containing the thus solvated uranium values, from residual solids.

4,880,608

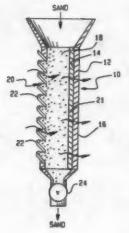
CONTACTOR/FILTER IMPROVEMENTS

David Stelman, West Hills, Calif., assignor to The United State of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 30, 1988, Ser. No. 213,798

Int. Cl.[4] B01J *8/00*

U.S. Cl. 423—244 **23 Claims**



14. A method of removing fine particulates from a gas stream, wherein said particulates range in size from approximately 1 to 10 microns, said method comprising:

passing a fine particulate-containing gas stream through a body of granular material of a median particle size of about 0.2 to 5 millimeters in diameter to a substantially gas-permeable microporous filter element;

isolating the body of granular material from an upstream surface of said microporous filter element with a particulate entrapment structure;

collecting the particulates with said entrapment structure so as to form a dust cake, which dust cake is disposed on an upstream surface of said entrapment structure and within said entrapment structure, below said upstream surface, including the step of providing said particulate entrapment structure with a plurality of spaced apertures ranging in size from approximately 1 to 10 microns;

scouring the upstream face of said entrapment structure to remove the dust cake therefrom, without removing said

dust cake disposed within said entrapment structure, below said upstream surface, by moving said body of granular material across the upstream face of said entrapment structure, thereby maintaining the gas stream pressure drop across the body of granular material, said entrapment structure and said microporous filter element within a desired range while concurrently removing particulate contaminants from the gas stream; and

withdrawing a substantially particulate-free gas stream from the downstream face of said microporous filter element.

4,880,609

CHELATE CATALYST SYSTEM FOR H_2S REMOVAL FROM A GAS STREAM

Ali R. Naraghi, Missouri City, Tex., assignor to Champion Chemicals, Inc., Houston, Tex.

Filed Nov. 23, 1988, Ser. No. 276,107
Int. Cl.[4] C01B *17/16, 3/20*
U.S. Cl. 423—226 **19 Claims**

1. A method for removing H_2S from a natural gas flow having H_2S mixed therein, the method comprising:

(a) delivering the natural gas flow into an upstanding vessel with an aqueous solution therein for contact with an effective amount of sodium nitrite for oxidation of the H_2S wherein the solution includes a transition metal chelate therein for catalyzing the oxidation of H_2S wherein the solution pH is in the range of about 7.0 to about 11.0;

(b) recovering natural gas after bubbling through the aqueous solution to remove the natural gas substantially free of H_2S;

(c) accumulating in loose precipitate form elemental sulfur in the solution and periodically removing the accumulated elemental sulfur precipitate therefrom; and

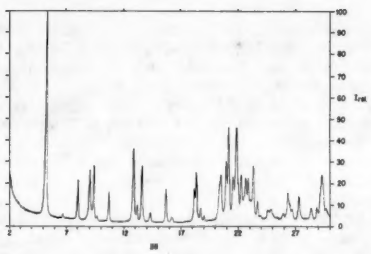
(d) periodically recharging the solution with additional sodium nitrite as the nitrite is consumed during oxidation of H_2S to sulfur and the sodium nitrite; catalyst ratio is 10:1 or more.

4,880,610

IN SITU CALCIUM PHOSPHATE MINERALS—METHOD AND COMPOSITION

Brent R. Constantz, Woodside, Calif., assignor to Norian Corporation, Mountain View, Calif.

Filed Apr. 20, 1988, Ser. No. 183,770
Int. Cl.[4] C01F *11/00*
U.S. Cl. 423—305 **12 Claims**



1. A method for making calcium phosphate minerals comprising:

combining phosphoric acid substantially free of uncombined water, a calcium source, neutralizing anions including at least one of carbonate, phosphate and hydroxide in an amount sufficient to substantially neutralise said phosphoric acid and water in an amount to provide a kneadable mixture at a physiologically acceptable temperature;

agitating the mixture to produce a substantially uniform mixture; and

allowing the mixture to set and become annealed to a hard workable structure.

4,880,611

CRYSTALLINE COMPOSITION

Roland von Ballmoos, Hopewell; Cynthia T-W. Chu, Princeton Junction; Michael E. Landis, Woodbury, all of N.J., and Eric G. Derouane, Namur, Belgium, assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 117,858, Nov. 6, 1987, abandoned, which is a continuation of Ser. No. 878,754, Jun. 26, 1986, which is a continuation-in-part of Ser. No. 642,925, Aug. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 562,673, Dec. 19, 1983, abandoned, and Ser. No. 615,391, May 25, 1984, abandoned, said Ser. No. 878,754, is a continuation-in-part of Ser. No. 685,186, Dec. 21, 1984, Pat. No. 4,623,527, which is a continuation-in-part of Ser. No. 562,909, Dec. 19, 1983, abandoned. This application Dec. 21, 1987, Ser. No. 136,083

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.[4] C01B *15/16*
U.S. Cl. 423—306 **15 Claims**

9. A composition of matter comprising crystals having a framework topology after heating at 110° C. or higher giving an X-ray diffraction pattern with interplanar d-spacings at 16.4±0.2 Angstroms, 8.2±0.1 Angstroms and 4.74±0.05 Angstroms, and without a significant interplanar d-spacing at 13.6–13.3 Angstroms, having been synthesized by the method comprising:

(1) providing a reaction mixture comprising sources of X oxide, Y oxide and Z oxide, wherein X represents one or more elements of +3 valence selected from the group consisting of aluminum, iron, chromium, vanadium, molybdenum, arsenic, antimony, manganese, gallium and boron; Y represents one or more elements of +5 valence selected from the group consisting of phosphorus, arsenic, antimony and vanadium; and Z represents one or more elements of +4 valence selected from the group consisting of silicon, germanium and titanium, one of said oxide sources being unstable in water, an organic directing agent D, inorganic cations M and anions N, and a substantially water-immiscible organic solvent for said oxide source unstable in the water, the components of said reaction mixture having the following relationship:

$$(D)_a:(M_2O)_b:(X_2O_3)_c:(ZO_2)_d:(Y_2O_5)_e:(\text{Solvent})_f:(N)_g:(H_2O)_h$$

where a, b, c, d, e, f, g, and h are numbers satisfying the following relationships:

a/(c + d + e) is less than 4,
b/(c + d + e) is less than 2,
d/(c + e) is less than 2,
f/(c + d + e) is from 0.1 to 15,
g/(c + d + e) is less than 2, and
h/(c + d + e) is from 3 to 150,

wherein upon initial provision of said reaction mixture said oxide source unstable in the water is dispersed or dissolved in the water-immiscible organic solvent;

(2) heating said reaction mixture at a rate of from 5° C. to 200° C. per hour to a temperature of from 80° C. to 300°;

(3) agitating said reaction mixture in a manner sufficient to intimately admix the water-immiscible organic solvent and the water with each other, thereby progressively hydrolyzing the oxide source unstable in water;

(4) maintaining said agitated reaction mixture at a tempera-

ture of from 80° C. to 300° C. and a pH of from 2 to 9 until crystals of said composition of matter are formed; and

(5) recovering from said reaction mixture said composition of matter.

4,880,612

HEXAAMMINEALUMINUM IODIDE MONOAMMONIATE AND PROCESS FOR ITS PREPARATION

Dieter Peters, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 240,147

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731454

Int. Cl.[4] C01B *21/00*

U.S. Cl. 423—413 13 Claims

1. A crystalline compound of the formula

$$[Al(NH_3)_6]I_3(NH_3)_x$$

wherein x is about 1.

4. A process for the preparation of hexaammineraluminum iodide monoammoniate by reacting aluminum, an iodine compound and ammonia, which comprises reacting the reactants without the addition of mercury at between room temperature and 600° C. under ammonia pressures of 8 to 2,000 bar in liquid ammonia and removing any excess ammonia after the end of the reaction at a temperature of 10° to 60° C. by vaporization under atmospheric pressure.

4,880,613

LIGHT EMITTING ELEMENT COMPRISING DIAMOND AND METHOD FOR PRODUCING THE SAME

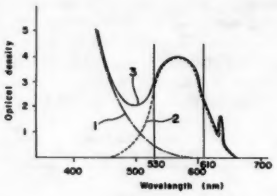
Shyuichi Satoh, and Kazuwo Tsuji, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 12, 1988, Ser. No. 143,114

Claims priority, application Japan, Jan. 12, 1987, 62-5730; Jul. 15, 1987, 62-176825; Oct. 29, 1987, 62-274494

Int. Cl.[4] B01J *3/08*

U.S. Cl. 423—446 13 Claims



7. The method according to claim 6, wherein the diamond is irradiated by an electron beam of 2 to 4 MeV for a dosage of 1×10^{17} to 1×10^{18} electrons/cm^2.

4,880,614

CERAMIC THERMAL BARRIER COATING WITH ALUMINA INTERLAYER

Thomas E. Strangman, Phoenix, and Patricia A. Solfest, Chandler, both of Ariz., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Nov. 3, 1988, Ser. No. 266,972

Int. Cl.[4] C23C *11/00, 13/00*

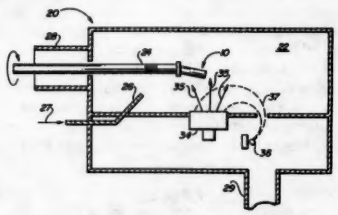
U.S. Cl. 428—623 9 Claims

1. An article of manufacture suitable for use in a gas turbine engine comprising:

a superalloy substrate,

a metallic bond coating on the substrate,

an insulative ceramic coating on the metallic bond coating, and



an interlayer between the bond coating and the ceramic coating which consists essentially of high purity alpha alumina.

4,880,615

STABILIZED RADIOPHARMACEUTICAL COMPOSITIONS

F. Peter Charleson, Kirkland, Canada, assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 25, 1988, Ser. No. 276,253

Int. Cl.[4] A61K *49/02;* C09K *15/22, 15/06*

U.S. Cl. 424—1.1 5 Claims

1. A stablized radiopharmaceutial composition comprising a molecule containing a radioactive iodine atom and a stabilizer selected from the group consisting of ascorbic acid, nicotinamide and its corresponding amides, or a mixture of ascorbic acid and nicotinamide and its amides, in a sufficient amount to stabilize against radiolytic decomposition.

4,880,616

STABLE STANNOUS CHLORIDE COMPOSITION FOR LABELING WITH RADIOACTIVE TECHNETIUM

Makoto Azuma; Jun Takahashi, both of Hyogo; Hirohiko Yamauchi, Osaka, and Nobuo Ueda, Hyogo, all of Japan, assignors to Nihon Medi-Physics Co., Ltd, Hyogo, Japan

Continuation of Ser. No. 791,474, Oct. 25, 1985, abandoned. This application Dec. 17, 1987, Ser. No. 135,527

Claims priority, application Japan, Oct. 26, 1984, 59-226395

Int. Cl.[4] A61K *49/02*

U.S. Cl. 424—1.1 2 Claims

1. A process for preparing a technetium 99m-labeled radioactive diagnostic agent consisting essentially of the steps of:

(a) preparing a solution of stannous chloride in a concentration of not less than 1.0 mol/liter by dissolving stannous chloride alone in water,

(b) charging solution prepared in step (a) to a container in an amount of not more than 500 microliters,

(c) lyophilizing to provide stannous chloride in a dry solid state in said container,

(d) adding water to said container to dissolve the stannous chloride therein and admixing ^{99m}Tc in the pertechnetate form to form ^{99m}Tc-labeled tin colloid.

4,880,617

LATTICE-ENTRAPPED COMPOSITION

Eric S. Abrutyn, Middletown, N.Y., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 882,609, Jul. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 683,603, Dec. 12, 1984, Pat. No. 4,724,240, which is a continuation-in-part of Ser. No. 246,663, Mar. 23, 1981, abandoned. This application Oct. 6, 1986, Ser. No. 915,749
The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.
Int. Cl.[4] A61K *7/035, 7/42, 9/42*
U.S. Cl. 424—501 13 Claims

1. A solid, lattice-entrapped powder composition comprising:

from about 5% to about 95% by weight of a cross-linked syneresis-free hydrophobic polymer lattice;

from about 95% to about 5% by weight of a powdered functional material;

wherein said functional material and the monomers of said cross-linked copolymer being polymerized in situ;

said functional material being dispersed uniformly throughout and entrapped within said polymer lattice.

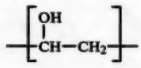
4,880,618

USE OF PARTIALLY ACETYLATED POLYVINYL ALCOHOL AS A FOAMING AGENT IN COMPOSITIONS IN THE FORM OF AEROSOLS

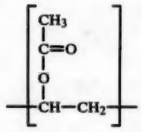
Jean F. Grollier, Paris; Claude Dubief, Le Chesnay, and Jean Mondet, Drancy, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 50,026, May 15, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 235,775
Claims priority, application Luxembourg, May 16, 1986, 86430
Int. Cl.[4] A61K *7/11;* C09K *3/30*
U.S. Cl. 424—43 31 Claims

1. An aqueous cosmetic composition for the treatment of the hair or the skin, in the form of a foam from an aerosol device in which it is packaged under pressure, in the presence of a propellant agent, comprising, in a cosmetically acceptable aqueous medium containing one or more cosmetic products for the cosmetic treatment of the hair or the skin, at least one partially acetylated polyvinyl alcohol containing at least units of formulae (I) and (II)



(I)



(II)

in which the units of formula (II) are present in proportions of greater than or equal to 3 mol % with respect to the totality of units in the polymer, this polymer possessing a viscosity at a concentration of 4% in water at 20 degrees C. of between 0.005 and 0.065 Pa.s.

4,880,619

ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Division of Ser. No. 710,876, Mar. 11, 1985, Pat. No. 4,590,064. This application May 2, 1986, Ser. No. 859,272
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] A61K *7/16, 7/22, 7/24, 7/18*
U.S. Cl. 424—52 20 Claims

1. An oral composition comprising an orally acceptable vehicle having a pH of about 4.5 to about 9 and containing in an effective amount, in the range of about 0.01% to about 10% by weight, as an anticalculus agent phosphonoformic acid or an orally acceptable salt thereof, and

an effective anticaries amount, in the range of about 0.01% to about 3.0% by weight, of a fluoride providing anticaries compound.

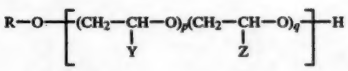
4,880,620

PERFLUORINATED SURFACE-ACTIVE OLIGOMERS, PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THESE OLIGOMERS

Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 832,766, Feb. 26, 1986, Pat. No. 4,778,675, which is a division of Ser. No. 473,639, Mar. 9, 1983, Pat. No. 4,584,196, which is a division of Ser. No. 156,398, Jun. 4, 1980, Pat. No. 4,399,077. This application Aug. 2, 1988, Ser. No. 227,120
Claims priority, application France, Jun. 7, 1979, 79 14639
Int. Cl.[4] A61K *7/075, 7/08;* C07C *43/11*
U.S. Cl. 424—70 7 Claims

4. A shampoo, conditioning rinse or conditioning lotion composition for the hair comprising in an aqeous or aqueous alcoholic vehicle a perfluorinated surface-active oligomer in an amount effective to impart an oleofugic effect to said hair, said perfluorinated surface-active agent having the formula



wherein

R is $H(CH_2)_m$—, $F(CF_2)_n$—CH_2—, $F(CF_2)_n$—CH_2—CH_2— or $H(CF_2)_n$—CH_2— wherein m and n represent an integer ranging from 1 to 16, or a group of the formula $A(CF_2)_n$—$(CH_2)_m$— wherein A represents hydrogen or fluorine, m represents an integer ranging from 1 to 16 and n represents zero or an integer ranging from 1 to 16, with the proviso that if n is zero, A represents hydrogen and if n represents an integer from 1 to 16, m represents 1, 2 or 3,

Y represents C_xF_{2x+1}, C_xF_{2x+1} CH_2—, C_xF_{2x+1} CH_2—O—CH_2—, C_xF_{2x+1} CH_2—CH_2—O—CH_2— or HC_xF_{2x} CH_2—O—CH_2—, wherein x represents an integer from 6 to 10,

Z represents —CH_2OH, and

p and q, each independently, represent an integer or decimal number ranging from 0.5 to 30.

4,880,621

COSMETIC COMPOSITION FOR THE TREATMENT OF THE HAIR AND SKIN COMPRISING A POWDER OF FLOWERS OR FLOWER TOPS AND A COHESION AGENT

Jean-Francois Grollier, Paris; Josiane Allec, Pierrefitte; Chantal Fourcadier, Paris; Georges Rosenbaum, Asnieres, and Patrick Darmenton, Villejuif, all of France, assignors to Societe Anonyme dite: l'Oreal, Paris, France

Division of Ser. No. 832,338, Feb. 24, 1986, Pat. No. 4,746,510, which is a division of Ser. No. 603,737, Apr. 25, 1984, Pat. No. 4,581,230, which is a division of Ser. No. 352,105, Feb. 25, 1982, Pat. No. 4,459,285. This application Feb. 4, 1988, Ser. No. 152,376

Claims priority, application Luxembourg, Feb. 27, 1981, 83173

Int. Cl.[4] A61K *7/06, 7/07, 7/48, 9/10*

U.S. Cl. 424—74 12 Claims

1. A cosmetic composition for application to the hair or skin comprising, in an aqueous medium, particles of pulverized flowers or flower tops having a granulometry lower than 125 microns and a cohesion agent present in an amount effective to maintain the homogeneity of said composition, said cohesion agent being a thickening agent, or an emulsion selected from a water-in-oil or an oil-in-water emulsion, said particles resulting from the pulverization of flowers or flower tops selected from the group consisting of crocus, cyclamen, dahlia, field larkspur (*Delphinium consolida*), edelweiss, geranium, wall flower, swordlily, gypsophila, live ever, garden balsam, orrice, hyacinthe, jasmine, lavatera, water lily, gilower, orchid, snowdrops, petunia, phlox, garden peony, sweet pea, polygonum, pyrethrym, primrose, French rose, clover, tulip and violet said thickening agent being selected from the group consisting of gum arabic, karoya gum, gum tragacanth, guar gum, carob bean gum, tara gum, pectines, alginates, carraghenates, agar-agar, furcellaria, starches, the water soluble portions of mucilagenous plants selected from the group consisting of mullein, wild chamomile, fenugreek, marsh mallow, mallow, flax, limes, psyllium, plantain, borage, star thistle, alder buckthron, common comfrey, asparagus, senna and lichen, methyl cellulose, hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, sodium polyacrylate, polyvinyl alcohol and carboxylic polymer derivatives of acrylic acid, said particles being present in an amount of at least 5 percent by weight based on the total weight of said composition and said cohesion agent being present in an amount of 0.1 to 20 weight percent of said composition.

4,880,622

WATER-SOLUBLE PHOSPHAZENE POLYMERS HAVING PHARMACOLOGICAL APPLICATIONS

Harry R. Allcock, State College, Pa.; Paul E. Austin, Williamstown, W. Va., and Sukky Kwon, University Park, Pa., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed May 20, 1986, Ser. No. 865,504

Int. Cl.[4] A61K *31/74;* A01N *25/26*

U.S. Cl. 424—78 6 Claims

1. A controlled release article of manufacture comprising a member selected from the group consisting of pharmaceuticals, pesticides, herbicides, plant growth regulators, and fertilizers in a physical admixture with a matrix of a polymer of the formula:

$$[NPR(R_2)]n$$

wherein (a) R is selected from the group consisting of lower alkoxy ethers or polyethers, imines, polyimines, sulfides, polysulfides, esters and polyesters, and (b) n is from about 10 to about 20,000.

4,880,623

PROCESS FOR THE PREPARATION OF SOLID NIFEDIPINE FORMULATIONS OF HIGH BIOAVAILABILITY AND WITH SUSTAINED EFFECT, AND FORMULATIONS THUS OBTAINED

Rossi Piergiorgio, Milan, and Calanchi Massimo, Monza, both of Italy, assignors to Eurand Italia S.p.A., Milan, Italy

Filed Oct. 14, 1986, Ser. No. 918,382

Claims priority, application Italy, Oct. 15, 1985, 22494 A/85

Int. Cl.[4] A61K *9/20, 9/22, 31/74*

U.S. Cl. 424—78 13 Claims

1. A solid pharmaceutical formulation consisting essentially of nifedipine as active principle, PEG, and inert excipient, characterized in that a starting solid micronized inert excipient which is soluble in the gastrointestinal juices is provided either per se or homogeneously admixed with micronized active principle, and in that polyethylene glygol of high molecular weight between about 2000 and 6000 is precipitated thereon in the case of an admixture of the starting micronized inert excipient plus micronized active principle, or in that polyethylene glycol of high molecular weight between about 2000 and 6000 together with micronized active principle is co-precipitated on the starting micronized inert excipient per se, the product being in the form of very fine particles having an extremely high total specific surface.

4,880,624

VOLATILE ATTRACTANTS FOR DIABROTICA SPECIES

Robert L. Metcalf, and Richard L. Lampman, both of Urbana, Ill., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Mar. 18, 1988, Ser. No. 170,159

Int. Cl.[4] A01N *25/00*

U.S. Cl. 424—84 18 Claims

1. In a method for attracting Diabrotica species, selected from the group consisting of:

northern corn root worm,

southern corn root worm,

western corn root worm, and

D. cristata, the improvement comprising the step of employing an effective amount of an admixture of essentially equivalent amounts of a first compound, selected from the group consisting of trimethoxybenzene and quaiacol, admixed with one or more of a second compound, selected from the group consisting of indole, phenylacetaldehyde, cinnamaldehyde and cinnamonitrile.

4,880,625

USE OF N,N-DIETHYL-M-TOLUAMIDE AND/OR THE ETHYL ESTER OF 2-METHYL-3-PENTENOIC ACID AS INSECT ATTRACTANTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, Long Branch, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances, New York, N.Y. and University of Florida, Gainesville, Fla.

Continuation of Ser. No. 26,979, Mar. 17, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 213,683

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] A01N *37/02, 37/18, 25/00*

U.S. Cl. 424—84 5 Claims

1. A method of attracting Musca domestica L.(Diptera:Muscidae) to an insect trap comprising the step of exposing the environment surrounding said trap to an insect attractant-containing polymer which consists of a mixture of a polymer and from about 1% up to about 45% by weight of said polymer of a composition of matter selected from the group consisting of:

(i) N,N-diethyl-m-toluamide;

(ii) the mixture of N,N-diethyl-m-toluamide and the ethyl ester of 2-methyl-3-pentenoic acid;

(iii) a mixture of N,N-diethyl-m-toluamide and dimethyl disulfide; and

(iv) a mixture of N,N-diethyl-m-toluamide, the ethyl ester of 2-methyl-3-pentenoic acid and dimethyl disulfide

said polymer being compatible with said composition of matter.

4,880,626

IMMUNOTHERAPEUTIC METHODS AND COMPOSITIONS FOR THE TREATMENT OF DISEASES OF VIRAL ORIGIN, INCLUDING ACQUIRED IMMUNE DEFICIENCY SYNDROME

John McMichael, Westfall & Larry Hill Rd., R.D. 1, Delanson, N.Y. 12053

Continuation-in-part of Ser. No. 692,822, Jan. 18, 1985, Pat. No. 4,692,332. This application Aug. 17, 1987, Ser. No. 86,372

Int. Cl.[4] A61K *39/00, 45/05, 39/40*

U.S. Cl. 424—88 10 Claims

1. A method for alleviating symptoms of acquired immune deficiency syndrome in a patient afflicted with acquired immune deficiency syndrome or acquired immune deficiency syndrome related complex comprising the steps of:

administering to the afflicted patient a member selected from the group consisting of characteristic substances of diseased cells of the acquired immune deficiency syndrome and effective fragments and effective derivatives thereof in a pharmaceutically effective amount which is less than the lowest amount necessary to provoke a humoral immune response in combination with the member, as exemplified by the presence of a positive wheal upon subcutaneous administration; and

co-administering an immune enhancer in a pharmaceutically effective amount which is less than the lowest amount of the substance necessary to induce a humoral immune response in combination with the member, as exemplified by the presence of a positive wheal upon subcutaneous administration.

4,880,627

SKIN THERAPEUTIC MIXTURE CONTAINING EUPATORIUM EXTRACT AND FORMULATIONS

Theodore Trenzeluk, Manville, N.J., assignor to Tecma Laboratories, Manville, N.J.

Continuation-in-part of Ser. No. 795,882, Nov. 7, 1985, Pat. No. 4,713,242. This application Jun. 23, 1986, Ser. No. 877,132

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[4] A61K *33/30, 35/78*

U.S. Cl. 424—640 9 Claims

1. A mixture for alleviating the skin conditions of acne, psoriasis, burns, pimples, blackheads, and open sores, said mixture comprising:

a. the aqueous extract from the leaves of the Eupatorium plant, said aqueous extract being prepared as follows: said leaves are dried under moderate light, under warm temperature, and with frequent tossing; then said dried leaves are ground to a very small particle size; and then said ground leaves are extracted with water; said aqueous extract being about 3% to about 30% by weight of said mixture;

b. a preservative being sulfathiazole, wherein said preservative is about 3.7% by weight of said mixture;

c. an inert pigment being zinc oxide, said inert pigment being about 14.2% by weight of said mixture; and

d. an oil soluble base being petrolatum, said oil soluble base being about 74.4% weight of said mixture.

4,880,628

SUSTAINED RELEASE COMPOSITION

William M. Allen, Reading; Bernard F. Sansom, Newbury; Alan D. Wilson, Liphook; Havard J. Prosser, Royston, and David M. Groffman, Harrow, all of England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 707,958, Mar. 4, 1985, Pat. No. 4,661,339, which is a continuation of Ser. No. 513,774, Jul. 14, 1983, abandoned. This application Feb. 20, 1987, Ser. No. 17,272

Claims priority, application United Kingdom, Jul. 20, 1982, 8220969; May 31, 1983, 8314888

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.[4] A61K *33/18*

U.S. Cl. 424—605 14 Claims

1. A sustained release formed composition, which comprises a source of at least one trace chemical element selected from the group consisting of selenium, cobalt and iodine incorporated into a phosphate cement and sustainedly releasable therefrom on contact with an aqueous medium.

4,880,629

DIALYTIC SOLUTION FOR PERITONEAL DIALYSIS

Takeshi Okamoto, Kawagoe; Mitsuo Iwata, Sagamihara, and Hiroaki Takahashi, Tokyo, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,343

Claims priority, application Japan, Apr. 25, 1985, 60-87621

Int. Cl.[4] A61K *31/14, 31/17*

U.S. Cl. 424—678 5 Claims

1. A dialytic solution for peritoneal dialysis, said dialytic solution comprising 0.5 to 40 g/liter of glycerol, 0.005 to 78 g/liter of glucose, 0.005 to 78 g/liter of fructose as osmotic pressure regulating agents for regulating the osmotic pressure to a level necessary for the removal of the water.

4,880,630

SKIN CARE COMPOSITIONS HAVING KERATOLYTIC AND ANTIINFLAMMATORY ACTIVITY

Tibor Novák, Lakitelek, Hungary, assignor to Innofinance Altalanos Innovacios Penzintezet, Budapest, Hungary

PCT No. PCT/HU85/00076, § 371 Date Aug. 7, 1987, § 102(e) Date Aug. 7, 1987, PCT Pub. No. WO87/03803, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 20, 1985, Ser. No. 105,229

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 8 Claims

1. A skin care composition in the form of a cream, body lotion, topical gel, or body powder having keratolytic and antiinflammatory activity comprising a cosmetically effective amount of an extract of the leaf, green stalk, or flower of *Lycium halimifolium* as active ingredient together with a cosmetically acceptable topical vehicle or diluent.

4,880,631

CONTROLLED POROSITY OSMOTIC PUMP

John L. Haslam, and Gerald S. Rork, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 24, 1987, Ser. No. 100,665

Int. Cl.[4] A61K *31/55*

U.S. Cl. 424—424 20 Claims

1. An osmotic pump, for the controlled release of diltiazem L-malate to an environment of use, said pump comprising:

(A) a core which comprises a therapeutically effective amount of diltiazem L-malate and between 80 and 150 percent by weight of sodium bitartrate surrounded by

(B) a rate controlling water insoluble wall, having a fluid permeability of 6.96×10^{-18} to 6.96×10^{-14} cm^3 sec/g and a reflection coefficient of less than 0.5, prepared from:

(i) a polymer permeable to water but impermeable to solute and

(ii) 0.1 to 60% by weight, based on the total weight of (i) and (ii), of at least one pH insensitive pore forming additive dispersed throughout said wall.

4,880,632

PREVENTION OF FESCUE TOXICOSIS

Luke B. Lipham; John A. Stuedemann, and Frederick N. Thompson, Jr., all of Athens, Ga., assignors to The United States of America, Washington, D.C. and University of Georgia Research Roundation, Inc., Athens, Ga.

Filed Sep. 8, 1987, Ser. No. 93,951
Int. Cl.[4] A61K *9/26, 31/165*
U.S. Cl. 424—425 8 Claims

1. A method for treatment or prevention of fescue toxicosis comprising:

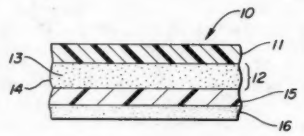
administering a composition wherein the active agent consists of a dopamine antagonist at a pharmaceutically effective dosage to an animal, wherein said dopamine antagonist is selected from the group of D_2 specific antagonists having minimal neurological and psychological adverse effects in grazing animals.

4,880,633

TRANSDERMAL DRUG DELIVERY SYSTEM

Alice E. Loper, Lederach, Pa., and Anup K. Majumdar, Eatontown, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 838,852, Mar. 12, 1986, Pat. No. 4,797,284.
This application Jul. 7, 1988, Ser. No. 216,059
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—449 13 Claims



1. A transdermal drug delivery system for administering drug over an extended period comprising

(a) a backing layer substantially impermeable to the drug and forming the top or outer surface of a bandage employing the delivery system,

(b) a reservoir layer comprising drug in a completely dissolved form in a continuous matrix or carrier,

(c) a membrane layer comprising a structure exhibiting some rate controlling property,

wherein a substantially constant release rate is achieved over a substantial part of the wear period by the combined action of the reservoir layer and the membrane layer wherein:

$$\frac{h/KD_m}{x_{max}/D_r} \geq \frac{(1-\beta\alpha)}{\beta\alpha} \text{ and} \qquad (1)$$

-continued

$$\frac{(x_{max})^2}{(TD_r)} \geq \frac{\beta\alpha}{(2\alpha-\beta\alpha-\beta\alpha^2)}\left[(1-\alpha)+\left\{\frac{(1-\alpha)(2+2\alpha-3\beta\alpha-\beta\alpha^2)}{2-\beta\alpha}\right\}^{1/2}\right] \qquad (2)$$

are satisfied simultaneously, and wherein

h is membrane thickness

K is partition coefficient between membrane and reservoir

D_m is diffusion coefficient of drug in membrane

x_{max} is reservoir thickness

D_r is diffusion coefficient of drug in reservoir

T is the desired wear time of the bandage,

α is a design parameter ranging from but not including 0 to and including 0.67, and representing the fractional drop in the theoretical flux from time zero to the end of the wear period T and

β is a design parameter ranging from but not including 0 to and including 1, which allows adjustments to shape of release profile, initial concentration, C_o, fraction of total drug depleted from the reservoir, h and x_{max}; and

$\geq$ signifies equal to or greater than.

4,880,634

LIPID NANO-PELLETS AS EXCIPIENT SYSTEM FOR PERORALLY ADMINISTERED DRUGS

Peter Speiser, Zurich, Switzerland, assignor to Dr. Rentschler Arzneimittel GmbH & Co., Laupheim, Fed. Rep. of Germany

Continuation of Ser. No. 740,771, Jun. 30, 1985, abandoned.
This application Jun. 26, 1987, Ser. No. 66,459
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421468
Int. Cl.[4] A61K *37/22, 9/50, 47/00*
U.S. Cl. 424—450 28 Claims

1. An excipient system containing a pharmacologically effective substance for peroral administration characterized in that the excipient system comprises lipid nano-pellets having a particle size of from about 50 to 1000 nm in the form of an aqueous, colloidal suspension, the lipid particles being present in the suspension in a concentration of from about 1 to 20% by weight, said lipid particles consisting of a mixture of at least one lipid and at least one surfactant in a ratio of from about 1:0.1 to 1:2.2, respectively, said particles consisting of from about 5 to 70%.by weight of at least one lipid, from about 0.01 to 70% by weight of at least one surfactant, and from about 0.05 to 25% by weight of a pharmacologically effective substance.

4,880,635

DEHYDRATED LIPOSOMES

Andrew S. Janoff, Yardley, Pa.; Pieter R. Cullis; Marcel B. Bally, both of Vancouver, Canada; Michael W. Fountain, Griggstown; Richard S. Ginsberg, Monroe, both of N.J.; Michael J. Hope; Thomas D. Madden, both of Vancouver, Canada; Hugh P. Schieren, Yardley, Pa., and Regina L. Jablonski, Trenton, N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 638,809, Aug. 8, 1984, abandoned, and a continuation-in-part of Ser. No. 749,161, Jun. 26, 1985, abandoned. This application Jul. 26, 1985, Ser. No. 759,419
Int. Cl.[4] A61K *37/22*
U.S. Cl. 424—450 9 Claims

1. A dehydrated liposome preparation comprising liposomes having a bilayer membrane and one or more protective sugars, wherein the protective sugars are present at both the inside and

outside surfaces of the liposome membrane so that the liposomes have retained a substantial portion of their internal contents during dehydration and retain a substantial portion of their contents upon subsequent rehydration.

4,880,636

FILM COATED TABLET OF RANITIDINE HCL

Robert M. Franz, 8712 Mariner Dr., Raleigh, N.C. 27615

Filed May 13, 1988, Ser. No. 194,427
Int. Cl.[4] A61K *9/36*
U.S. Cl. 424—480 6 Claims

1. A ranitidine HCl tablet coated with a polymeric film comprising; hydroxypropyl methylcellulose (HPMC), 5% to 25% (based on the weight of said HPMC) triacetin and optionally 5% to 65% (based on the weight of said HPMC) colorant or opacifying agent.

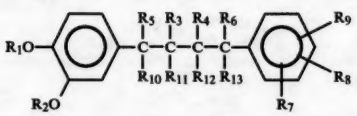
4,880,637

COMPOSITIONS OF CATECHOLIC BUTANES WITH ZINC

Russell T. Jordan, Fort Collins, Colo., assignor to Chemex Pharmaceuticals, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 699,923, Feb. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 578,501, Apr. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,631, Feb. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 365,781, Apr. 5, 1982, abandoned, which is a continuation-in-part of Ser. No. 49,886, Jun. 19, 1979, abandoned. This application Oct. 28, 1986, Ser. No. 924,620
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] A61K *33/30, 31/08, 31/02*
U.S. Cl. 424—641 25 Claims

1. A pharmaceutical composition comprising at least 1 catecholic butane of the formula:



wherein R_1 and R_2 are independently H, lower alkyl, or lower acyl;

R_3, R_4, R_5, R_6, R_{10}, R_{11}, R_{12} and R_{13} are independently H or lower alkyl;

R_7, R_8 and R_9 are independently H, hydroxy, lower alkoxy or lower acyloxy; and

ionic zinc.

4,880,638

BIOCIDAL COMPOSITION AND METHOD FOR DISINFECTING ARTICLES

Gordon, Gilbert, Oxford, Ohio, assignor to Bioxy International, Ltd., Fort Worth, Tex.

Filed Aug. 23, 1988, Ser. No. 235,378
Int. Cl.[4] A01N *39/00, 59/00, 59/08, 59/14*
U.S. Cl. 424—662 15 Claims

1. A biocidal composition comprising water, a source of chlorite ions, a source of chloride ions and a source of chlorate ions where the mol ratio of chlorite ions to chlorate ions is in the range from about 2:1 to about 1000:1, the mol ratio of chlorite ions to chloride ions is from about 0.1:1 to about 1000:1 and the mol ratio of chloride ions to chlorate ions is in the range from about 0.1:1 to about 1000:1; the chlorite ion source present in amounts of from about 40 grams to about 0.04 milligrams per thousand grams of water; and the composition including a pH adjusting material in an amount sufficient to adjust the pH of the mixture to above 7.0.

4,880,639

TASTE OF HENS' EGGS

Georg Lauermann, Bad Segeberg, and Clemens Thobe, Horst in Holstein, both of Fed. Rep. of Germany, assignors to Henkel Kommandigesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,701
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727735
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 5 Claims

1. A method for improving the flavor of hens' eggs comprising feeding the hens a mixed feed containing from about 10 to about 6,000 ppm of at least one essential oil.

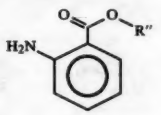
4,880,640

FLAVORING WITH SCHIFF BASE REACTION PRODUCTS OF ALKYL ANTHRANILATES

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Point Pleasant, both of N.J.; Nicholas Calderone, Laurel Hollow, N.Y., and Keith P. Sands, Marlboro, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

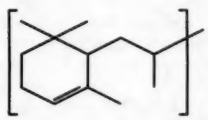
Continuation-in-part of Ser. No. 171,778, Sep. 12, 1988, Pat. No. 4,806,363. This application Oct. 21, 1988, Ser. No. 260,578
Int. Cl.[4] A23L *1/226, 1/235*
U.S. Cl. 426—3 5 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of intimately admixing with said foodstuff or chewing gum from about 0.1 ppm up to about 100 ppm of a schiff base reaction product produced according to the process of reacting an alkyl anthranilate having the structure:



wherein R'' represent methyl or ethyl with a carbonyl-containing compound having the structure:

wherein R' represents hydrogen or methyl and R is:



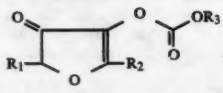
4,880,641

PINEAPPLE KETONE CARBONATE DERIVATIVES

Brian Byrne, Belleville, N.J., and Louise M. L. Lawter, Goshen, N.Y., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 120,760, Nov. 9, 1987, Pat. No. 4,758,680, which is a continuation of Ser. No. 627,311, Jul. 2, 1984, abandoned. This application May 6, 1988, Ser. No. 192,058
Int. Cl.[4] A23L *1/235*
U.S. Cl. 426—3 2 Claims

1. A foodstuff composition comprising: a foodstuff and a flavor effective amount of a compound of the general formula,



wherein R_1 and R_2 independently are —H, $—CH_3$ or $—CH_2CH_3$; and R_3 is alkyl of from 1 to 10 carbons are aryl of from 6 to 10 carbons.

4,880,642

METHOD OF MAKING CHEWING BONES FOR PETS

Jos Berends, M. de Klerkstraat 27, 1333 PL Almere Bulten, Netherlands

Filed Nov. 30, 1987, Ser. No. 126,968

Int. Cl.[4] A23K *1/10, 1/18*

U.S. Cl. 426—5 7 Claims

1. A method of making chewing bones for pets comprising:

cooking a batch of tendons of cattle, cows, bulls, oxen, horses and ponies in an aqueous solution for a period of approximately five hours at a temperature higher than 90° C.;

removing substantially all meat and fat from said tendons;

heating said batch of tendons to approximately 240° C. in a period of approximately 1.5 hours;

lowering said temperature from approximately 240° C. to approximately 190° C.;

maintaining said temperature of approximately 190° C. for approximately 1.5 hours to obtain a substantially 90% hardened batch of tendons; and then

baking the remaining unhardened tendons of said batch for an additional period until substantially all of the tendons of said batch are hardened.

4,880,643

BEER AND OTHER BEVERAGES AND THEIR MANUFACTURE

Charles W. Bamforth, Staffordshire, and Roy Cope, West Midlands, both of England, assignors to Bass Public Limited Company, Burton-on-Trent, United Kingdom

Continuation-in-part of Ser. No. 644,912, Aug. 27, 1984, abandoned. This application Aug. 4, 1987, Ser. No. 81,570

Claims priority, application United Kingdom, Sep. 3, 1983, 8323686; Apr. 18, 1984, 8410142

Int. Cl.[4] C12C *5/02*

U.S. Cl. 426—16 7 Claims

1. A method of improving the head of an beverage made by the fermentation of hopped malt wort without creating objectionable haze therein by steps comprising:

forming a proteinaceous additive separately from the beverage by hydrolyzing albumen so that the molecular chains of at least some of the protein molecules in the albumen are shortened, and

subsequently adding an effective amount of the hydrolyzed albumen to said beverage.

4,880,644

PROCESS FOR PRODUCING IMITATION MARZIPAN

Hidenobu Matsunami; Takahiro Tsuruda; Naoki Hitosugi, and Yoshinori Hirukawa, all of Sennan, Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Sep. 30, 1988, Ser. No. 251,443

Claims priority, application Japan, Sep. 30, 1987, 62-248617; Dec. 16, 1987, 62-319841; May 25, 1988, 63-129306

Int. Cl.[4] A23G *3/00*

U.S. Cl. 426—46 3 Claims

1. A process for producing an imitation marzipan which comprises:

(a) soaking dehulled, degerminated and cracked soy beans in hot water at a temperature of at least 95° C. until the bean flavor of soy beans has been removed,

(b) cooling the soy beans with cold water at 10° to 20° C. for 1 to 2 minutes,

(c) dehydrating the soy beans to such a degree that water absorption of the soy beans becomes 40 to 90 parts by weight per 100 parts by weight of cracked soy beans before the treatment with hot water,

(d) adding to the soy beans sugar in a weight ratio of soy beans : sugar of 1:2 to 3:1 and a fat ingredient in an amount of 4 to 20% by weight based on the total weight of the imitation marzipan to obtain a mixture,

(e) mixing and grinding the mixture,

(f) subjecting the ground mixture to heat treatment at 70° to 90° C. for 30 to 50 minutes and then

(g) cooling.

4,880,645

COATING CEREAL WITH FRUIT JUICE

Thomas L. Carpenter, Shamong, N.J.; William Fisher, Elkorn, Nebr., and Thomas A. Smith, Battle Creek, Mich., assignors to General Foods Corp., White Plains, N.Y.

Filed Sep. 14, 1987, Ser. No. 97,221

Int. Cl.[4] A23L *1/64;* A23P *1/08*

U.S. Cl. 426—89 25 Claims

1. A sweetened, dry comestible consisting essentially of a dry comestible, said dry comestible having a coating comprising a combination of a sweetening syrup having from 9% to 85% by weight reducing sugars and a pectin solution and wherein the ratio of sweetening syrup to pectin ranges from 20:1 to 25:1 and preferably 22:1, said combination is coated on to the comestible in amounts sufficient to impart a sweetness level and flavor profile similar to a sucrose-coated comestible wherein said sweetened, dry comestible does not stick or clump together with other sweetened, dry comestible.

4,880,646

ENCAPSULATED CORN KERNELS AND METHOD OF FORMING THE SAME

Chel W. Lew, and Darren E. Barlow, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Nov. 29, 1988, Ser. No. 277,296

Int. Cl.[4] H23L *1/36*

U.S. Cl. 426—93 10 Claims

1. Encapsulated corn kernels consisting essentially of kernels of corn suitable for popping coated over at least a portion of the outer surface thereof with an edible oleaginous substance or edible wax and thereover with an outer shell of an edible polymer.

4,880,647

PROCESS FOR MILD HEAT TREATMENT OF CONCENTRATED FLUIDS FROM MEMBRANES

Stratos E. Hatzidimitriu, San Jose, Calif., and W. Reginald Hall, Winnetka, Ill., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 10, 1989, Ser. No. 321,944

Int. Cl.[4] A23L *2/30;* B01D *13/02*

U.S. Cl. 426—239 2 Claims

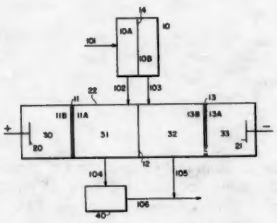
1. A process for reducing the concentration of microbial cells in a flowable fluid comprising the steps of:

a. contacting the flowable fluid with at least one membrane which is permeable to the fluid portion of the flowable fluid and impermeable to microbial cells or enzymes thereby separating the flowable fluid into a fluid permeate free from microbial cells and enzymes and a flowable retentate containing microbial cells and enzymes,

b. introducing fluid permeate and flowable retentate into adjacent compartments of an electrolytic cell containing a cathode in a cathode compartment and an anode in an anode compartment, said adjacent compartments being separated from each other by a cation permeable mem-

brane and being separated from the cathode compartment and the anode compartment by bipolar membranes aligned such that the anolyte permeable surfaces of each are proximal to the anode, the fluid permeate being introduced into the more electronegative compartment, the flowable retentate being introduced into the more electropositive compartment,

c. urgng an electric current to flow through said cell, thereby reducing the pH of said flowable retentate and increasing the pH of the fluid permeate,



d. withdrawing flowable retentate having a reduced pH from the more electropositive compartment and maintaining said flowable retentate at a sufficient temperature and for a sufficient time to reduce the concentration of viable microbial cells and enzymes therein,

e. withdrawing fluid permeate from the more electronegative compartment and combining said fluid permeate with flowable retentate from step (d) to reconstitute the flowable fluid with a reduced concentration of viable microbial cells and enzymes.

4,880,648

PROCESS FOR MANUFACTURING STORABLE FRUIT PREPARATIONS CONTAINING WHOLE FRUITS

Hans Stamer, Kurt-Schumacher-Strasse 53, D-2120 Lüneburg, Fed. Rep. of Germany

PCT No. PCT/EP87/00555, § 371 Date Jul. 28, 1988, § 102(e) Date Jul. 28, 1988, PCT Pub. No. WO88/02218, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 29, 1987, Ser. No. 220,220

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1986, 3633820; Jul. 22, 1987, 3724214

Int. Cl.[4] A23L *3/16*

U.S. Cl. 426—241 **24 Claims**

1. Process for the production of storable fruit preparations containing whole fruits without the addition of preservatives, wherein whole fruit is mixed with crystalline sugar or a concentrated sugar solution to form a first mixture of fruit and juice, the process comprising the steps of:

(a) gently agitating the first mixture until the dry mass of the fruit amounts to about 35 to 65% by weight,

(b) gently separating the fruit from the juice,

(c) adjusting the density of at least a portion of the juice to a density effective to substantially uniformly suspend the separated fruit in the juice,

(d) combining the density adjusted juice and the separated fruit to form a second mixture in which the fruit is substantially uniformly suspended in the juice,

(e) uniformly heating the second mixture by use of microwave energy in a micro-wave heating zone, and

(f) cooling the second mixture to form a sterilized fruit preparation containing whole fruit.

4,880,649

PROCESS FOR FLAVOURING AN EDIBLE COMPOSITION

Günter Holzner, Grand-Lancy; Peter Kittner, Thonex, and Anthony Blake, Grand-Lancy, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Mar. 15, 1988, Ser. No. 167,749

Claims priority, application Switzerland, Mar. 26, 1987, 1153/87

Int. Cl.[4] A23F *3/40*

U.S. Cl. 426—302 **4 Claims**

1. A process for flavouring a composition chosen from among products for infusion or decoction selected from the group consisting of tea, camomile, verbena and mint in the form of leaves, powders or particles, said process comprising the steps of:

directly spraying said composition with an emulsion comprising:

5 to 30% of a solid film-building vehicle selected from the group consisting of polyvinyl acetate, polyvinyl alcohol, dextrins, natural or modified starch, natural or modified proteins, vegetable gums, pectins, xanthanes, carboxymethyl cellulose, methyl cellulose, hydroxyethyl cellulose and lipoheterosaccharides;

0.1 to 20% of an emulsifying agent selected from the group consisting of fatty-acid mono- or diglycerides, esters derived from a combination of fatty acids with sorbitol or a saccharide or alkoxylated derivatives thereof, or an ester of tartaric, citric, ascorbic or lactic acid; and

0.5 to 20% of an active volatile flavouring substance which is non-miscible with water with the remainder of the emulsion being water; and

subsequently drying the emulsion-sprayed composition such that the flavouring substance is in direct contact with the leaves, powders or particles of the composition and is retained in the form of droplets coated with a protective water soluble layer consisting of said film-building vehicle.

4,880,650

METHOD FOR STABILIZATION TREATMENT OF BEER WITH HYDRATED SILICA GEL

Katsutoshi Okamura, Nagoya; Yasuo Esaki, Kasugai; Koichi Matsuzawa, Fujimi, and Katsuhiko Asano, Takasaki, all of Japan, assignors to Fuji-Davison Chemical, Ltd., Kasugai and Kirin Brewery Company Limited, Tokyo, both of, Japan

Filed Jan. 15, 1988, Ser. No. 144,168

Claims priority, application Japan, Mar. 5, 1986, 61-47847

Int. Cl.[4] C12H *1/02*

U.S. Cl. 426—330.4 **2 Claims**

1. A method for treating beer, comprising:

adding a hydrated silica gel of a xerogel structure which has a specific surface area of 530–720 m^2/g, a pore volume of 0.9–1.5 ml/g, a mean pore diameter of 50–120 Å, a water content of 7–25% by weight and a pH, which as a 5% aqueous suspension, is 6.0–8.0 to beer in a post fermention and aging step so that said silica adsorbs and removes colloidal components which cause haze in beer; and

separating silica gel from said beer.

4,880,651

METHOD OF AND APPARATUS FOR PRODUCING INFUSIBLE BAG HOLDERS

Hugh P. Christie, 50 Bevington Rd., Glenunga 5064, Australia

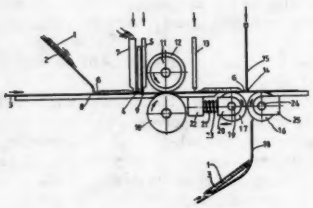
PCT No. PCT/AU87/00134, § 371 Date Jan. 14, 1988, § 102(e) Date Jan. 14, 1988, PCT Pub. No. WO87/06913, PCT Pub. Date Nov. 19, 1987

PCT Filed May 12, 1987, Ser. No. 171,000

Claims priority, application Australia, May 15, 1986, PH05919

Int. Cl.[4] B65B *29/04*

U.S. Cl. 426—394 13 Claims



1. A method of attaching a cover to an infusible bag, the method comprising the steps of: providing a cover strip; feeding a water-permeable bag containing an infusible substance onto the cover strip, the bag having opposed sides and a marginal edge; creasing the cover strip to form a fold line; directly attaching the bag along the marginal edge thereof to the cover strip adjacent to but at one side of the fold line of the cover strip such that the entire bag lies to one side of the fold line; and then folding the cover strip to at least substantially cover both sides of the bag.

4,880,652

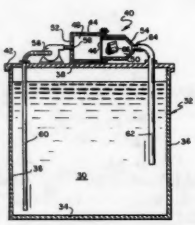
METHOD OF FILTERING EDIBLE LIQUIDS

Robert Regutti, Bridgeview, Ill., assignor to GyCor International Ltd., Bridgeview, Ill.

Filed Dec. 4, 1987, Ser. No. 128,735

Int. Cl.[4] A23L *1/01, 1/015;* A23D *5/04*

U.S. Cl. 426—417 10 Claims



1. The method of removing unwanted constituents from a body of edible liquid comprising the steps of immersing a closed packet containing a mass of granulated filtering material comprising hydrated synthetic amorphous silica in a body of edible liquid, the filtering material being adapted to adsorb the unwanted constituents, the closed packet having a wall of material pervious to the edible liquid and substantially impervious to the filtering material, thereafter maintaining the packet in the body of edible liquid for a period of time, whereby the unwanted constituents of the body of edible liquid are adsorbed in the mass of filtering material within the packet, and thereafter removing the closed packet with its contents from the body of edible liquid.

4,880,653

CONTINUOUS PRODUCTION OF PRETZELS

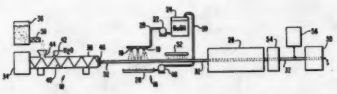
Lewis C. Keller, North Richland Hills, and Cecil A. Bowles, Lewisville, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 898,226, Aug. 20, 1986, Pat. No. 4,759,939. This application Jul. 25, 1988, Ser. No. 223,358

The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.

Int. Cl.[4] A23P *1/12*

U.S. Cl. 426—549 14 Claims



1. A method of continuous production of a pretzel which comprises: introducing to the feed zone of an extruder an essentially dry mixture comprising 70 to about 85% flour, 9 to about 15% of at least one of corn syrup and corn syrup solids, and 0.5 to about 1.5% salt; injecting water into the mixture in the extruder barrel to raise its moisture content to between 19% and 25%; mixing the ingredients in the extruder barrel while maintaining the temperature of the mixture below about 140° F.; extruding the mixture through a die to form a continuous ribbon of extrudate; exposing the extrudate ribbon to a caustic solution; and transporting the ribbon through an oven where it is baked to a final moisture content of between about 1.0% and 3.0%.

4,880,654

PROCESS FOR PREPARING SIMULATED MEAT

Minoru Okada, 4-31-16 Mejiro, Toshimaku, Tokyo, Japan

Continuation of Ser. No. 944,187, Dec. 22, 1986, abandoned. This application Jul. 14, 1988, Ser. No. 219,887

Int. Cl.[4] A23L *1/317, 1/325;* A23P *1/10*

U.S. Cl. 426—574 8 Claims

1. A process for preparing edible fibrous particles simulating the torn flakes of meat comprising the steps of:

(a) preparing an aqueous solution of soluble alginate and a substance selected from the group consisting of protein and starch and mixtures thereof said aqueous solution comprising 0.5 to 5 weight percent of soluble alginate, and 1 to 20 weight percent of at least one of starch and protein, said soluble alginate selected from the group consisting of sodium alginate, potassium alginate and ammonium alginate,

(b) mixing, kneading and beating said aqueous solution together with a subsequently added aqueous gelling solution, at room temperature thereby to form fibrous particles, and further mixing said particles then,

(c) separating the fibrous particles from the resulting solution and removing excess water therefrom by compression, and

(d) cooking the fibrous particles at between 70° and 100° C. for between 20 to 60 minutes to heat set same,

(e) said particles having the shape of an entangled mass of torn threads each being between 10 to 50 mm in length and 1 to 5 mm in diameter,

(f) said aqueous solution of soluble alginate and at least one of protein and starch, and said aqueous gelling solution, being employed in volume ratio to each other of about 1:05 to 1:2.

4,880,655

CHOCOLATE SYRUP AND METHOD OF MAKING SAME

Douglas Dow, 1080 Iroquois, Detroit, Mich. 48214, and Patricia J. Flanagan, 18917 Highlite Dr., S., Mt. Clemens, Mich. 48043

Filed Jul. 29, 1985, Ser. No. 760,162
Int. Cl.[4] A23L *1/08*
U.S. Cl. 426—593 15 Claims

1. Chocolate syrup having the following composition (in weight percent);
top grade honey 66–87;
high-fat processed powdered cocoa 9–11;
water 4–25.

4,880,656

PROCESS FOR THE DEAROMATIZING AND REAROMATIZING TEA

Erwin Schütz, Trostberg, and Heinz-Rüdiger Vollbrecht, Stein/-Traun, both of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 126,416, Nov. 30, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,931
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640967
Int. Cl.[4] A23F *3/42*
U.S. Cl. 426—386 15 Claims

1. A process for the dearomatising and subsequent re-aromatising of black or green tea comprising
(a) removing the volatile aroma components from moist tea with a moist inert gas with a relative moisture content of 80–95% at a temperature of from 60° to 95° C. by means of carrier gas distillation, wherein at temperatures above 80° C. a contact zone with copper surfaces is used,
(b) selectively removing the water from the moist, inert gas stream containing the volatile aroma components and
(c) subsequently passing the volatile aroma components through dry tea allowing the dry tea to be aromatised with the dry inert gas stream.

4,880,657

SHORTENING COMPOSITIONS CONTAINING POLYOL POLYESTERS

Timothy B. Guffey, West Chester; Susan S. Abe, Mason, both of Ohio; Sherry R. Talkington, Florence, Ky., and Marko D. Mijac, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 47,367, May 6, 1987, abandoned. This application Apr. 12, 1988, Ser. No. 175,004
Int. Cl.[4] A23D *5/00*
U.S. Cl. 426—601 17 Claims

1. A shortening composition comprising:
(a) from about 10% to about 80% by weight intermediate melting polyol fatty acid polyesters having at least 4 fatty acid ester groups, wherein the polyols are selected from the group consisting of sugars and sugar alcohols containing 4 to 8 hydroxyl groups and mixtures thereof and wherein each fatty acid group has from about 8 to about 22 carbon atoms; and wherein the polyol polyesters have: (i) a non-Newtonian plastic rheology at 100° F. (37.8° C.) and has a viscosity of not less than about 15 poise at 100° F. (37.8° C.) after 10 minutes of steady shear at 10 sec.$^{-1}$, (ii) a liquid/solid stability of not less than 90 percent at 100° F. (37.8° C.), and (iii) an iodine value between 25 and 55;
(b) from about 20% to about 88% by weight soft oil comprising from about 0% to about 50% liquid polyol fatty acid polyesters having an iodine value between 60 and 130 and from about 20% to about 88% liquid triglycerides having an iodine value between 70 and 130;
(c) from about 2% to about 20% by weight hardstock fat comprising from about 0% to about 10% hardstock polyol fatty acid esters and from about 2% to about 20% hardstock triglycerides;
(d) from about 0% to about 50% by weight intermediate melting triglycerides; and
(e) from about 0% to about 15% by weight other shortening ingredients;
(f) wherein the shortening has a Solid Fat Content (SFC) such that the overall slope of the SFC curve between 50° F. (10° C.) and 105° F. (41° C.) is between 0.00 and −0.40; and
(g) wherein the shortening has a penetration between about 120 mm/10 and about 400 mm/10 at 70° F. (21° C.).

4,880,658

OBTAINING A FAT FRACTION WITH AZEOTROPIC SOLVENTS

Francis E. Luddy, Hatboro, Pa., and Sergio Longhi, Parma, Italy, assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 83,861, Aug. 5, 1987, Pat. No. 4,839,191, which is a continuation of Ser. No. 812,274, Dec. 23, 1985, abandoned, which is a division of Ser. No. 517,508, Jul. 26, 1983, Pat. No. 4,601,857. This application Feb. 27, 1989, Ser. No. 316,477
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] A23D *5/00*; C11B *3/00*
U.S. Cl. 426—607 13 Claims

1. A process for preparing a fat fraction comprising:
(a) dissolving a fat in a binary azeotropic solvent mixture wherein the volume of solvent is from 1.5 ml to 8.0 ml per gram of fat;
(b) cooling the solution from step (a) to 16° C. to 22° C. to form a precipitate;
(c) separating the precipitate and solvent phase of step (b);
(d) washing the precipitate from step (c) with fresh solvent mixture which has been cooled to about 2° C. below the solvent temperature utilized in step (b) using a volume of at least about 8% of the volume of solvent utilized in step (b); and
(e) separating the washed precipitate and solvent phase of step (d) for obtaining a solid fat fraction.

4,880,659

PROCESSING TOFU OR DOUGH FOR PROCESSED TOFU TO RESULT IN MEAT-LIKE TEXTURE

Yoshinobu Akiyama, Hidakamachi; Sakashi Yoshihashi, Higashikurume, and Iwao Sakauchi, Higashimurayama, all of Japan, assignors to Kyodo Milk Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 878,319, Jun. 25, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 202,680
Claims priority, application Japan, Jul. 6, 1985, 60-147656
Int. Cl.[4] A23J *3/00*; A23L *1/20*
U.S. Cl. 426—656 2 Claims

1. A method for producing an edible food possessing a meat-like texture, which comprises: dehydrating tofu or dough for processed tofu selected from the group consisting of deep fried tofu, roasted tofu and deep fried tofu mixed with chopped vegetables to a water content of 60–70.1%; cooking the dehydrate in a twin screw extruder at 120°–180° C. with a residence of 80–160 seconds in the extruder; and extruding the cooked dehydrate from the extruder.

4,880,660

METHOD FOR PRIMING HARD TISSUE

Steven M. Aasen, Lakeland, and Joel D. Oxman, St. Louis Park, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 28, 1987, Ser. No. 91,051

Int. Cl.[4] A61C *5/04;* A61K *6/08;* A01N *1/02;* C09K *3/00*

U.S. Cl. 427—2 32 Claims

1. A method for adhering to or coating hard tissue, comprising the steps of:

(a) applying to said tissue a single phase aqueous primer solution comprising water, and effective amounts of a water-soluble film former and a salt of an acid, the amount of said water being sufficient so that said primer forms a homogeneous liquid when shaken briefly at room temperature, and

(b) hardening said film former.

4,880,661

METHOD OF MANUFACTURING A THIN-FILM ELECTROLUMINESCENT DISPLAY ELEMENT

Yoshihiro Endo, Nara; Masashi Kawaguchi, Shiki; Hiroshi Kishishita, Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 35,224, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 772,371, Sep. 9, 1985, abandoned. This application Sep. 15, 1988, Ser. No. 246,890

Claims priority, application Japan, Sep. 17, 1984, 59-195237

Int. Cl.[4] B05D *3/06, 5/12;* C23C *14/00*

U.S. Cl. 427—38 3 Claims

1. A method of manufacturing a thin-film EL element comprising the steps of

forming a first electrode,

forming a first dielectric layer by sputtering,

forming a luminescent layer,

forming a second dielectric layer by plasma chemical vapor deposition, and

forming a second electrode.

4,880,662

METHOD AND APPARATUS FOR PROCESSING UV-HARDENABLE REACTION RESIN COMPOUNDS

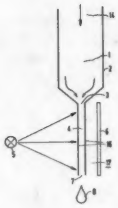
Reiner Habrich, Kirchheim, and Heiner Bayer, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,431

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 3702999

Int. Cl.[4] B05D *3/06;* B28B *1/14*

U.S. Cl. 427—54.1 6 Claims



1. A method for coating substrates and casting molds with a resin composition comprising a UV-hardenable reaction resin compound and a photoinitiator, comprising the steps of:

irradiating the UV-hardenable reaction resin composition in an applicator;

adding at least one additive selected from the group consisting of flexibility agents, parting agents, adhesion promoters, anti-aging agents, dyes and pigments; and

feeding the irradiated resin composition with the at least one additive immediately to a substrate or casting mold.

4,880,663

METHOD FOR APPLYING A MOISTUREPROOF INSULATIVE COATING TO PRINTED CIRCUIT BOARDS USING TRIANGULAR OR DOVETAIL SHAPED LIQUID FILMS EMITTED FROM A FLAT-PATTERN NOZZLE

Takaji Shimada, Kawaguchi, Japan, assignor to Nordson Corporation, Westlake, Ohio

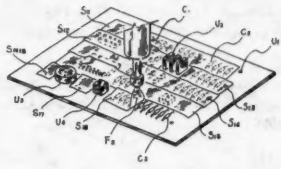
Continuation-in-part of Ser. No. 941,365, Dec. 15, 1986, Pat. No. 4,753,819. This application Jun. 13, 1988, Ser. No. 206,199

Claims priority, application Japan, Dec. 27, 1985, 60-294768

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—96 7 Claims



1. A mask-free method of applying insulative coating to selected areas of a circuit board without applying insulative coating to regions to be left uncoated, comprising the steps of:

supplying insulative liquid coating material to a flat-pattern nozzle means at a supply pressure to produce a liquid film emission from the nozzle means in a flat pattern having a generally triangular shape with a lower horizontal base edge and an upper apex, which has a maximum width W at its lower base edge below which discrete liquid droplets of coating begin to form, and which decreases in width to an approximately zero width at a distance L above said lower base edge, said triangular shaped liquid film being substantially free of atomized particles of coating,

positioning the nozzle means and circuit board at a specified distance apart relative to each other to position the circuit board in the path of the flat triangular shape liquid film pattern,

producing relative movement between the nozzle means and circuit board in a direction generally transverse to the plane of the flat pattern, and

controlling the liquid coating supply during relative movement between the nozzle means and circuit board to (a) supply liquid to the nozzle means when the flat pattern is directed toward the selected areas to be coated to impinge a flat liquid film thereon and thereby coat the areas to be coated, and (b) interrupt the supply of liquid to the nozzle means when the flat pattern is directed toward the regions to be left uncoated to terminate emission of the flat liquid film and prevent deposit thereof on the regions to be left uncoated.

4,880,664

METHOD OF DEPOSITING TEXTURED TIN OXIDE

James G. O'Dowd, Levittown; Anthony W. Catalano, Furlong; Charles M. Fortmann, Langhorne, and Ora J. Lee, Bristol, all of Pa., assignors to Solarex Corporation, Rockville, Md.

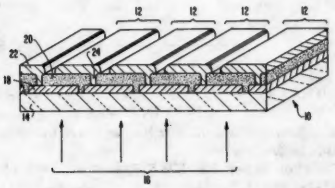
Filed Aug. 31, 1987, Ser. No. 90,851

Int. Cl.[4] B05D *5/12;* C23C *16/40*

U.S. Cl. 427—109 31 Claims

1. A method of forming a textured layer of transparent conductive oxide on a vitreous substrate, comprising the steps of:

depositing a first film of tin oxide on said substrate by chemical vapor deposition from a first reactant mixture comprising tin chloride, water, and alcohol while holding said substrate at a preselected reaction temperature; and



depositing a second film of tin oxide on said first tin oxide film by chemical vapor deposition from a second reactant mixture free of alcohol and comprising tin chloride and water while holding said substrate at said preselected reaction temperature.

4,880,665

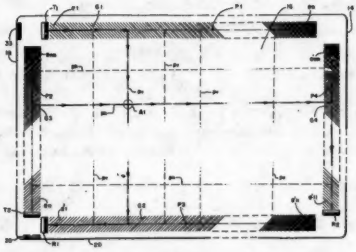
TOUCH CONTROL ARRANGEMENT FOR GRAPHICS DISPLAY APPARATUS HAVING SAW REFLECTORS OF FRIT COMPOSITION

Robert Adler, Northfield; Mark Fogelson, Wilmette, both of Ill., and Sam Kaplan, Deerfield Beach, Fla., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 4,740, Jan. 20, 1987, which is a continuation-in-part of Ser. No. 698,306, Feb. 5, 1985, Pat. No. 4,700,176. This application Jun. 8, 1988, Ser. No. 203,857

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—126.3 **7 Claims**



1. A method of manufacturing touch panel apparatus having a substrate with a surface capable of propagating surface acoustic waves; comprising the steps of:

applying to said substrate surface at least one SAW reflecting element formed of a frit composition and thereafter heating said first composition to devitrify it and bond said element to said substrate surface.

4,880,666

METHOD OF MANUFACTURING MAGNETIC RECORDING MEDIUM

Takeo Ito; Hajime Takeuchi, both of Yokohama; Minoru Hashimoto, Kawasaki; Toshio Fukaya, Yokohama, and Masumi Koishi, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 660,371, Oct. 12, 1984, abandoned. This application Dec. 17, 1987, Ser. No. 136,436

Claims priority, application Japan, Dec. 27, 1983, 58-249866

Int. Cl.[4] H01F *10/02*

U.S. Cl. 427—128 **5 Claims**

1. A method of manufacturing a magnetic recording medium, comprising the steps of:

mechanically pulverizing and mixing an essentially dry composition containing a magnetic powder consisting of hexagonal ferrite and a solid resin with a dispersion mixer to prepare an essentially dry mixed powder;

transferring said essentially dry mixed powder to a dispersing apparatus to dissolve and disperse said essentially dry mixed powder in a solvent, thereby preparing a magnetic paint; and

applying the magnetic paint on a base to form a magnetic recording layer.

4,880,667

PHOTOCHROMIC PLASTIC ARTICLE AND METHOD FOR PREPARING SAME

Cletus N. Welch, Clinton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 779,750, Sep. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 717,618, Mar. 29, 1985, abandoned. This application Oct. 15, 1987, Ser. No. 110,636

Int. Cl.[4] B05D *5/00, 5/06;* D06D *5/00*

U.S. Cl. 427—160 **31 Claims**

1. A method for imparting a photochromic response to a synthetic plastic surface, which comprises:

(a) applying a substantially mottle-free, substantially homogeneous film of polymeric resin having a spiro(indoline) photochromic material dissolved therein onto said surface, said film having a substantially uniform thickness across the portion of the surface to which it is applied and being substantially dry as soon as it is applied, said polymeric resin being a solvent for the photochromic material and remaining solid at the incorporation temperatures of step (b),

(b) heating the film-bearing plastic surface at temperatures near to but below the melting temperature of the photochromic material for a time sufficient to incorporate a photochromic amount of the photochromic material into the subsurface of the synthetic plastic surface, and

(c) thereafter removing the photochromic-lean film from said surface.

4,880,668

MIRROR PROTECTIVE COMPOSITION COMPRISING 2-MERCAPTOTHIAZOLINE

Deborah E. Hayes, Verona; Alan B. Weissberg, Pittsburgh; Charles B. Friedlander, Glenshaw, and Edward T. Ryan, Harwick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 14, 1989, Ser. No. 845,168

Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—162 **3 Claims**

1. In an improved process for preparing a protective coating for a mirror comprising applying a protective composition to the mirror having a surface layer of silver, copper, nickel or a mixture thereof, the improvement comprising using the protective coating comprising a reaction product of:

(a) 2-mercaptothiazoline, and

(b) a resinous material or a precursor thereof.

4,880,669

METHOD OF PRODUCING A FLAT GASKET

Karsten Dorn, Elchingen; Peter Grosch, Finningen, and Ingo Kremer, Senden, all of Fed. Rep. of Germany, assignors to Reinz-Dichtungs GmbH, Neu-Ulm/Donau, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 223,511

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724515

Int. Cl.[4] B05D *5/00, 1/32*

U.S. Cl. 427—210 15 Claims

1. A method for producing a flat gasket comprising the steps of:

fabricating a core for the gasket; and

applying an overlay to both sides of the core using screen printing, the overlay having a mesh structure of bars and openings and consisting of an incompressible material.

4,880,670

CHEMICAL VAPOR DEPOSITION OF GROUP IB METALS

Ahmet Erbil, Atlanta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jun. 22, 1988, Ser. No. 210,022

Int. Cl.[4] B05D *3/02;* C23C *16/00*

U.S. Cl. 427—226 16 Claims

1. A process for depositing a metallic coating on a heated substrate by thermal decomposition of an organometallic compound, said process comprising contacting a vapor of one or more organometallic compounds of the formula (I)

where M is a group IB metal and R_1 and R_2 are each lower alkyl or alkenyl radicals containing from 1 to 6 carbon atoms, with said heated substrate, said substrate being at a temperature above the decomposition temperature of said organometallic compound.

4,880,671

METHOD AND APPARATUS FOR COATING RUNNING WEBS

Hans-Peter Sollinger; Albrecht Meinecke; Hans Weiss, all of Heidenheim, and Rudolf Beisswanger, Steinheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Continuation of Ser. No. 797,234, Nov. 13, 1985, abandoned. This application Apr. 7, 1987, Ser. No. 35,450

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442079; Dec. 21, 1984, 3446757

Int. Cl.[4] B05D *3/12;* B05C *3/12*

U.S. Cl. 427—356 8 Claims

7. A process for applying a coating substance to a moving paper web by chamber means receiving said coating substance and an applicator space defined generally at said paper web by a throttling means and a doctor blade, said coating substance being received by conduit means from said chamber means in order to discharge said coating substance into said applicator space at the side of said applicator space where said paper web first enters said applicator space for coating said paper web as said paper web travels from said throttle means toward said doctor blade, wherein the quantity of said coating substance discharged into said applicator space is in excess of that required to coat said traveling paper web, draining by drain means a major portion of said excess of coating substance from said applicator space, wherein throttling at the side of said applicator space where said paper web first enters said applicator space by said throttle means situated in close juxtaposition to said paper web as to define a throttling path between said throttle means and said paper web to sufficiently restrict the flow therethrough to a minor portion of said excess of coating substance to a volume rate of flow which at a maximum is one-third of the volume rate of flow of said major portion flowing through said drain means whereby such of said minor portion of said excess coating substance as flows through and exits said throttling path exits in the form of a film abruptly separating from said paper web and flowing downwardly along said throttle means.

4,880,672

METHOD AND APPARATUS FOR BLADECOATING OF A MOVING WEB

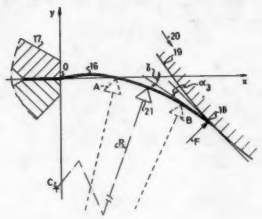
Tore Ericksson, Klissbol, Sweden, assignor to Inventing S.A., Lausanne, Switzerland

Continuation of Ser. No. 873,529, Jun. 12, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 232,540

Claims priority, application Sweden, Jun. 12, 1985, 8502927

Int. Cl.[4] B05D *3/12;* B05C *11/02*

U.S. Cl. 427—356 13 Claims



1. A method of varying the application amount of coating agent applied by bladecoating of a moving web, preferably a paper web, by control of engagement pressure of a coating blade against the web, the web supported by a rotating support roller, said blade clamped into a blade holder along one longitudinal edge, an opposite longitudinal edge of said blade being in engagement with the web and being in a substantially arcuate shape with predetermined angle defined between a tip of the blade and the web so as to define an area of engagement, comprising, displacing a control pressure acting on a major surface of the blade in a transverse direction of the blade towards and away from the web and controlling the size of the control pressure to the blade position to provide a predetermined blade engagement pressure against the web by said displacing of the control pressure and to substantially constantly maintain the angle between the web and the blade tip.

4,880,673

ACRYLATE BINDER AND ITS USE FOR DRESSING LEATHER

Leo Tork, Leverkusen; Hans-Günter Vogt, Dormagen, both of Fed. Rep. of Germany, and Ferdinand Heins, Kapellen, Belgium, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 25,998, Mar. 16, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 240,138

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610576

Int. Cl.[4] B32B *27/36, 9/02;* B05D *1/36*

U.S. Cl. 427—412 5 Claims

1. A process for dressing soft leather using acrylate binders for the primer and for the finish, comprising using

(I) an acrylate binder comprising (a) 56 to 98% by weight of a C_2–C_8-alkyl acrylate, (b) 2 to 4% by weight (meth)acrylic acid, (c) 0 to 25% by weight acrylonitrile, (d) 0 to 40% by weight methyl methacrylate and (e) 0 to 5% by weight of one or more other comonomers containing no acidic,

basic or crosslinking groups, having a film hardness of 25° to 40° Shore A, for the primer and

(II) an aqueous dispersion containing an acrylate binder comprising (a) 38 to 80% by weight of a C_2–C_8-acrylate, (b) 2 to 4% by weight of (meth)acrylic acid, (c) 10 to 20% by weight of acrylonitrile, (d) 0 to 40% by weight methyl methacrylate and (e) 0 to 5% by weight of one or more other monomers containing acidic, basic of crosslinking groups, having a film hardness of 75° to 99° Shore A, for the finish,

where the binders are obtained by copolymerizing the monomers in the presence of 0.02 to 0.5% by weight of an organic peroxo compound and 1.0 to 5.0% by weight of an anionic emulsifier, the percentages relating to the sum of (a) to (e).

4,880,674

SYNTHETIC RESIN MOLDING FOR AUTOMOTIVE VEHICLES

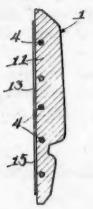
Shoji Shimizu, Tokyo, Japan, assignor to Katayama Kogyo Co., Ltd., Okayama and Shoei Jushi Co., Ltd., Tokyo, both of, Japan

Filed Oct. 4, 1988, Ser. No. 253,124

Claims priority, application Japan, Oct. 19, 1987, 62-158700[U]; Dec. 4, 1987, 62-184440[U]

Int. Cl.⁴ B60R *13/04*

U.S. Cl. 428—31 **16 Claims**



1. A generally elongated synthetic resin molding having a predetermiend length that is mounted on the body, window frame or bumper of an automotive vehicle, said synthetic resin molding comprising:

(a) a body of molding formed by extruding a synthetic resin, and

(b) a plurality of core yarns of glass fiber embedded within said molding, wherein said glass fiber yarns embedded within said molding are disposed in parallel relation to each other along the longitudinal direction of said molding.

4,880,675

HOT-FILLABLE PLASTIC CONTAINERS

Rajendra K. Mehta, Hampton, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 25, 1988, Ser. No. 185,715

Int. Cl.⁴ B65D *23/00*; B29C *71/00*; B32B *27/00*

U.S. Cl. 428—35.7 **20 Claims**

1. A coextruded container having both improved thermal resistance and improved flavor and aroma barrier properties comprising: a polyethylene inner layer having a thickness in the range of 0.5–10.0 mil which forms the interior surface of the container, and a polypropylene outer layer which forms the exterior surface of the container, said polypropylene layer having a thickness such that the ratio of polypropylene to polyethylene thickness is at least 2:1, and wherein said polyethylene layer which forms the interior surface of the container has been treated with a reactive source of fluorine.

4,880,676

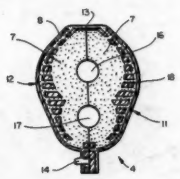
CABLE SEALING APPARATUS

Luis Puigcerver, Fuquay-Varina, N.C.; Gerald Shimirak, Danville, Calif., and Jorgen Berth, Kvistgaard, Denmark, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 5, 1988, Ser. No. 177,718

Int. Cl.⁴ H02G *15/08*

U.S. Cl. 428—35.7 **24 Claims**



1. A cable sealing apparatus, comprising a first end seal that can be positioned around a first cable and that can support a cable splice case housing, the first end seal comprising:

(a) a gel having a cone penetration value as measured according to ASTM D217-68 at 21° C. of 50–200 (10^{-1} mm) and an ultimate elongation as measured according to ASTM D638-80 at 21° C. of at least 50%, the gel having a first aperture through which the first cable can pass, which aperture has a substantially annular internal rib, said rib makes an angle which is less than perpendicular with respect to a longitudinal axis at a base of said rib; and

(b) means forming a convoluted outer surface of the first end seal, the convolution extending circumferentially around the end seal.

4,880,677

MATTED GLASS

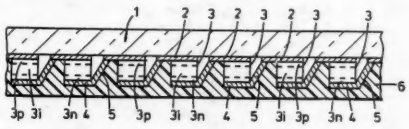
André Hecq, Nalinnes, and Jean-Francois Thomas, Ottignies, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Apr. 6, 1987, Ser. No. 35,267

Claims priority, application United Kingdom, Apr. 8, 1986, 8606495

Int. Cl.⁴ C03C *15/00*

U.S. Cl. 428—38 **13 Claims**



1. Light transmitting glass having at least one surface area which is matted by surface pits, comprising;

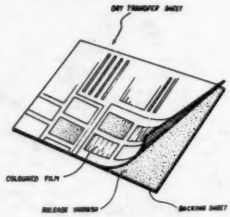
an etched surface area having a population of merging or contiguous surface pits of polyhedral form, which population of merging or contiguous surface pits have a small area so that a disk having a diameter of 10 μm cannot be placed thereon without overlapping at least two pits and so that at least 30% of visible light normally incident on said surface is diffusely transmitted through said surface and said surface having a total luminous transmittance of normally incident visible light of not less than TT-10, where TT is the total luminous transmittance through the same surface prior to etching expressed as a percentage of the total incident visible light.

4,880,678

DRY TRANSFER SHEET

Italo Goffi, Alba, Italy, assignor to Miroglio Tessile S.p.A., Cuneo, Italy

Filed Jun. 20, 1988, Ser. No. 208,432
Claims priority, application Italy, Jun. 19, 1987, 53445/87[U]
Int. Cl.[4] A61F *13/02*
U.S. Cl. 428—40 2 Claims



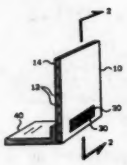
1. A dry transfer sheet comprising a coloured film adhering to a backing sheet with the interposition of a layer of release varnish, characterized in that the coloured film includes from 30 to 50% by weight after curing of pigment, from 15 to 35% of acrylic polymer, from 1 to 4% of cycloaliphatic epoxy resin, from 15 to 35% of vinyl copolymer, from 1 to 4% of polyethylene wax, and in that the layer of release varnish includes from 40 to 80% of the acrylic polymer, from 15 to 40% of vinyl copolymer and from 5 to 20% of polypropylene wax.

4,880,679

EMI SHIELDED PLASTIC COMPOSITES

Benedict R. Bonazza, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 25, 1988, Ser. No. 173,230
Int. Cl.[4] B29C *65/00*; B32B *31/00*
U.S. Cl. 428—57 20 Claims



1. An article comprising a first subpart characterized by electrically conductive fibers embedded in a continuous plastic matrix and a second subpart characterized by electrically conductive fibers embedded in a continuous plastic matrix, said subparts being joined together along a fusion line, and an electrically conductive insert embedded in said first subpart and said second subpart along the fusion line which contacts the electrically conductive fibers in the first subpart and the second subpart and establishes continuity between the electrically conductive fibers in the first subpart and the electrically conductive fibers in the second subpart.

4,880,680

ARTICLE OF MANUFACTURE AND METHOD FOR ENCASING SAME

David R. Kistner, Troy, Mich., assignor to Sota Technology, Inc., Troy, Mich.

Filed May 23, 1988, Ser. No. 197,595
Int. Cl.[4] B32B *1/06*
U.S. Cl. 428—74 2 Claims

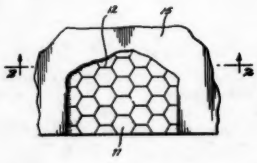
1. An article of manufacture comprising:
a first sheet of flexible plastic material, and a second sheet of flexible plastic material;
a porous body comprising a fiberglass mat having good sound deadening and insulation properties, and a first side, and a second side, spaced from the first side, and a continuous side edge between and bordering said first and second sides;
the porous body being encapsulated between the first sheet of flexible plastic material and the second sheet of flexible plastic material; being at least partially embedded across the entire surface of both of said
said sheets of plastic material being at least sides of the porous body; and
the first sheet of plastic material being heat-sealed to the second sheet of plastic material adjacent the side edge of the porous body to form a continuous heat-sealed seam around the body;
whereby the article retains at least a portion of the sound-deadening and insulation properties of the porous body.

4,880,681

LOW HEAT OUTPUT COMPOSITE

James O. Price, Auburn; Albert J. Stewart, Maple Valley, and Sally A. Hasselbrack, Seattle, all of Wash., assignors to Heath Tecna Aerospace, Co., Kent, Wash.

Filed Feb. 26, 1988, Ser. No. 160,528
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 21 Claims



1. A low heat output composite comprising:
(a) reinforcing fibers distributed throughout a resin matrix, said resin matrix comprising;
(b) a major amount of phenolic-based resin; and
(c) a minor amount of phosphorus-containing polymer, said minor amount effective to cause the low heat output composite to exhibit a total heat release of less than about 65 kilowatt-minute/m^2 when subjected to combustion conditions including a radiant heat source.

4,880,682

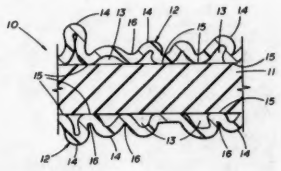
LOW GLOSS FILM AND PROCESS OF MANUFACTURE (FP 1323)

Donald R. Hazelton, Chatham, N.J.; Douglas J. Laurent, Houston, Tex.; Lawrence K. Locke, Seabrook, Tex., and William J. Hodgson, Jr., Baytown, Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Mar. 22, 1988, Ser. No. 171,730

Int. Cl.[4] B32B *27/14*

U.S. Cl. 428—152 **17 Claims**



1. A multilayer coextruded film which comprises

(a) a core layer of an elastomeric material; and

(b) at least one skin layer of a thermoplastic material, said skin layer being secured to said core layer at spaced apart contact areas and having a microundulating surface in the machine direction or transverse direction such that the film has a gloss of less than 20 as determined by ASTM D1003-67.

4,880,683

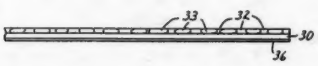
HOT-TACKIFYING ADHESIVE TAPE

Robert H. Stow, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 89,678, Aug. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 445,864, Dec. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 334,820, Dec. 28, 1981, abandoned. This application May 11, 1988, Ser. No. 192,486

Int. Cl.[4] B32B *3/12, 7/10, 15/08;* C09J *7/02*

U.S. Cl. 428—200 **21 Claims**



1. Heat-activatable substantially non-thermosettable, substantially non-crosslinkable adhesive tape that can be wound upon itself in roll form for convenience in storage and use and comprises a heat-resistant flexible backing and an adhesive layer which is nontacky or poorly tacky at 20° C., said adhesive layer comprises an acrylic polymer of acrylic ester monomer and is free of a reactive hot-melt resin, wherein the improvement comprises:

(1) said acrylic ester monomer provides at least 50 mol percent of the acrylic polymer of said adhesive layer,

(2) said acrylic polymer has a Tg or a weightaveraged Tg of from −10° C. to 80° C., and

(3) said adhesive layer has a Shear value of at least 25 minutes at 65° C., said adhesive layer adheres well to a clean substrate upon contact when heated to a temperature about 50° C. above the Tg or weight-averaged Tg of said acrylic polymer.

2. Heat-activatable adhesive tape as defined in claim 1 wherein said adhesive layer comprises an acrylic copolymer of monomers, up to 50 mol % of which is at least one copolymerizable polar monomer selected from acrylic acid, methacrylic acid, itaconic acid, maleic acid, maleic anhydride, amides of said acids, acrylonitrile, methacrylonitrile, and N-vinyl-2-pyrrolidone.

11. Heat-activatable adhesive tape as defined in claims 1 or 2 wherein said backing is an electrically-conductive metal foil, the adhesive layer is in contact with one face of the metal foil, and there is a low-adhesion backside coating on the other face of the metal foil.

4,880,684

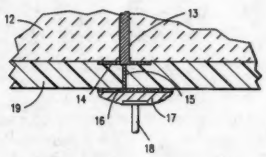
SEALING AND STRESS RELIEF LAYERS AND USE THEREOF

David W. Boss, Beacon; Timothy W. Carr, Hopewell Junction; Derry J. Dubetsky, Wappingers Falls; George M. Greenstein, Hopewell Junction; Warren D. Grobman, Carmel; Carl P. Hayunga, Poughkeepsie; Amanda H. Kumar, Hopewell Junction, all of N.Y.; Walter F. Lange, Longmont, Colo.; Robert H. Massey; Paul H. Palmateer, both of Wappingers Falls, N.Y.; John A. Romano, Hopewell Junction, N.Y., and Da-Yuan Shih, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,290

Int. Cl.[4] B32B *3/00, 7/00;* B44C *1/22;* B29C *37/00*

U.S. Cl. 428—209 **60 Claims**



1. A structure for electrically interconnecting a substrate having conductive vias therein and associated articles comprising:

at least one first conductive bonding pad disposed on the surface of said substrate in alignment with said conductive vias;

at least one layer of polymeric material disposed on the surface of said substrate covering said first bonding pads;

at least one second conductive bonding pad deposited on said at least one polymeric layer; and

at least one conductive medium disposed in said polymeric material contacting said first and said second bonding pads.

4,880,685

PROCESS FOR SEPARATING AND/OR REACTING PARTICLES

Michael Hirth, Unterentfelden, and Norbert Wiegart, Baden, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 3, 1987, Ser. No. 128,271

Claims priority, application Switzerland, Dec. 10, 1986, 4917/86

Int. Cl.[4] B01D *47/00;* B01J *8/00;* C10H *23/00*

U.S. Cl. 423—210 **7 Claims**

1. A process for treating particles which comprises at least a heavy metal vaporizable at a first temperature, at least an organic pollutant which can be converted into gaseous and solid compounds at a second temperature and at least dust, which process comprises:

mixing the particles and a gaseous carrier medium into a mixture before their joint entry into a heating device at controlled rates to provide a fluidized blend;

heating the fluidized blend in a fluidized bed of the heating device to the higher of the first and second temperatures thus vaporizing the heavy metal and converting the organic pollutant;

retaining the dust in the form of particles in the mixture;

immediately after the mixture has left the heating device, before cooling of the mixture can take place, collecting a majority of the dust and solid compounds from the mixture; and

then passing the remaining part of the mixture forward for mixing with the gaseous carrier medium so that the remaining part of the mixture is recycled through the process.

4,880,686

THERMAL TRANSFER MATERIAL

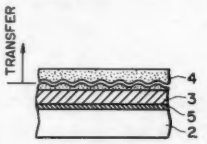
Hisao Yaegashi, Yokohama; Tetsuo Hasegawa, Tokyo; Naoki Kushida, Yokohama; Koichi Tohma, Kawasaki, and Takayuki Suzuki, Saitma, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,819

Claims priority, application Japan, Oct. 17, 1986, 61-246605

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—212 **7 Claims**



1. A thermal transfer material, comprising: a support and at least a first adhesive layer, a first ink layer and a second ink layer disposed in the order named on the support, wherein the adhesion strength (F_1) between the support and the first ink layer and the adhesion strength (F_2) between the first and second ink layers satisfy the relationships $F_1 > F_2$ at a higher temperature and $F_1 < F_2$ at a lower temperature; said first ink layer comprising a binder and a pigment, said binder having a glass transition temperature (tg) of 0° C. or below, said pigment constituting 25 to 85 wt. % of the first ink layer and said first adhesive layer comprising a particulate wax component and an adhesive component wherein said particulate wax component constitutes a larger proportion by weight of the first adhesive layer than the adhesive component; said particulate wax component having a softening temperature of 60°–150° C. and comprising at least one wax selected from the group consisting of whale wax, beeswax, lanolin, carnauba wax, candelilla wax, montan wax, ceresin wax, paraffin wax, microcrystalline wax, ester wax, low-molecualr weight polyethylene or oxidized polyethylene, Fischer-Tropsch wax, lauric acid, myristic acid, palmitic acid, stearic acid, behenic acid, stearyl alcohol, behenyl alcohol, fatty acid ester of sucrose, fatty acid dester of sorbitane, and oleic amide.

4,880,687

MAGNETIC RECORDING MEDIUM

Kenji Yokoyama; Masatoshi Nakayama; Toru Shimozawa; Kunihiro Ueda, and Fumio Maruta, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,317

Claims priority, application Japan, May 9, 1986, 61-106148; May 9, 1986, 61-106149; May 9, 1986, 61-106150; May 9, 1986, 61-106151; May 9, 1986, 61-106152

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

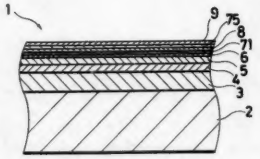
Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—141 **10 Claims**

1. A magnetic recording medium comprising a nonmagnetic rigid substrate having opposed major surfaces,

a metal thin film magnetic layer disposed on one major surface of the substrate, and

a topcoat layer on the magnetic layer, said topcoat layer comprising a plasma-polymerized film containing carbon, fluorine, wherein the carbon content ranges from 30 to 80 atom %, the hydrogen-to fluorine atom ratio ranges from 0.1.0 to 1.0:1.0, and the average fluorine-to-carbon atom ratio (F/C) in the region of said film that extends from the surface remote from the substrate to ⅓rd of its thickness is at least 1.5 times that in the region of the film that extends from the surface adjacent to the substrate to ⅓rd of its



thickness, said plasma-polymerized film being prepared by activating a gaseous reactant into a plasma to generate active species thereof while feeding the reactant into a plasma zone with W/F.M set to 10^7 to 10^{15} joule/kg, wherein W is an input power applied for plasma generation, F is the flow rate of the gas reactant, and M is the molecular weight of the gas reactant, whereby the polymerized film has a thickness of 3 to 800 Å and a contact angle with water in the range of from 100° to 130°.

4,880,688

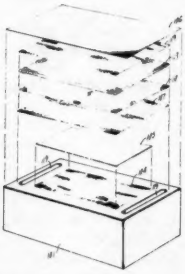
BREATHER MATERIALS FOR HIGH PRESSURE MOLDING

Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 138,739, Dec. 28, 1987. This application Dec. 23, 1988, Ser. No. 289,111

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—141 **8 Claims**



1. A breather layer particularly adapted for acting as a fluid path to remove fluids from articles during molding comprising:

at least two flexible layers of beads said beads dimentionally stable at pressures up to about 20.7 MPa; and

a layer of breather fabric about 0.2 mm to about 0.6 mm disposed thereon.

4,880,689

DAMAGE RESISTANT DECORATIVE LAMINATE

John J. Park; Paul W. White, both of Loveland, and Calvin Richardson, Cincinnati, all of Ohio, assignors to Formica Corporation, Wayne, N.J.

Filed Oct. 18, 1985, Ser. No. 788,772
Int. Cl.[4] D06N 7/04
U.S. Cl. 428—143 23 Claims

1. A decorative laminate having improved resistance against marring, abrasion, staining, dusting and crocking, said laminate comprising a substrate and a decorative sheet in superposed relation, said decorative sheet having at least on the exposed surface thereof a layer consisting essentially of a thermoset resin chosen from the group consisting of melamine formaldehyde, modified melamine formaldehyde, and polyester, substantially fully hydrolyzed polyvinyl alcohol, fumed amorphous silica, and particulate abrasive material having a hardness higher than that of silica, the proportions of said thermoset resin, polyvinyl alcohol, fumed amorphous silica and particulate abrasive being such that said exposed surface exhibits mar resistance of less than 4% gloss change by the herein described test, and abrasion resistance greater than 3,000 cycles (NEMA Wear) by the NEMA test LD 3-3.01.

4,880,690

PERFUME PATCH

Michael Szycher, Lynnfield, and Jonathan L. Rolfe, North Easton, both of Mass., assignors to Thermedics, Inc., Woburn, Mass.

Continuation of Ser. No. 95,055, Sep. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 932,696, Nov. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 768,623, Aug. 23, 1985, Pat. No. 4,638,043, which is a continuation-in-part of Ser. No. 726,809, Apr. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 670,810, Nov. 13, 1984, Pat. No. 4,614,787. This application Sep. 9, 1988, Ser. No. 243,152
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.[4] D03D 3/00; B32B 7/02; D04B 1/02; A01N 25/26
U.S. Cl. 428—224 27 Claims

1. A perfume patch comprising a fragrance-emitting member comprising a polyurethane consisting essentially of

(1) a diisocyanate;

(2) a glycol having a molecular weight between the range of 500–5000 molecular weight units;

(3) an acrylyl chain terminator having a molecular weight between the range of 40 and 200 molecular weight units; and

(4) a photoinitiator into which a perfume is dispersed; and

(5) a barrier layer adhered to the fragrance-emitting member.

4,880,691

FINE DENIER FIBERS OF OLEFIN POLYMERS

Lawrence H. Sawyer, and George W. Knight, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 672,009, Nov. 16, 1984, which is a continuation-in-part of Ser. No. 581,480, Feb. 17, 1989, abandoned. This application Jun. 10, 1987, Ser. No. 60,717
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[4] C08F 210/16; D03D 15/00; D04H 3/16
U.S. Cl. 428—225 30 Claims

1. Fine denier fibers comprised of melt-spun, melt-drawn linear low density copolymers of ethylene with at least one alpha-olefin of C_3 to C_{12}.

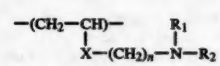
4,880,692

MAGNETIC RECORDING MEDIUM

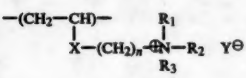
Katsumi Ryoke; Masatoshi Takahashi; Akihiro Hashimoto; Tsutomu Okita, and Kazuko Hanai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1988, Ser. No. 171,360
Claims priority, application Japan, Mar. 19, 1987, 62-62711
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—323 10 Claims

1. A magnetic recording medium comprising a support having provided on one surface thereof a magnetic recording layer containing ferromagnetic particles dispersed in a binder and on the other surface thereof a backing layer, wherein said binder comprises a vinyl chloride/vinyl acetate copolymer resin containing at least one group represented by formula (I) or (II):



(I)



(II)

wherein X represents a —COO— group, a —CONH— group, or a $—C_6H_4—$ group; n represents an integer of from 1 to 10; R_1, R_2, and R_3 each represents a hydrogen atom, an alkyl group having from 1 to 10 carbon atoms, or an alkyl derivative having from 1 to 10 carbon atoms, or R_1, R_2 and R_3 may be combined to each other to form a heterocyclic ring; and $Y^{\ominus}$ represents a halogen atom, $ClO_4^{\ominus}$, or $HgI_3^{\ominus}$; or $Y^{\ominus}$ is bound to R_2, R_2 represents an alkylene group having from 1 to 10 carbon atoms, and $Y^{\ominus}$ represents a $—COO^{\ominus}$ group, an $—SO_3^{\ominus}$ group, or an $—OSO_3^{\ominus}$ group; and wherein said copolymer resin contains from 60 to 95 wt % of a vinyl chloride unit and greater than 0 wt % of a vinyl acetate unit based on the total amount of said polymer resin; and wherein the amine content of said copolymer resin is from 0.01 to 5 wt % in terms of the nitrogen content based on the total amount of said copolymer resin; and wherein said copolymer resin has a degree of polymerization of from 100 to 700.

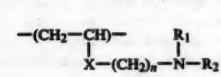
4,880,693

MAGNETIC RECORDING MEDIUM

Katsumi Ryoke; Masatoshi Takahashi; Akihiro Hashimoto; Tsutomu Okita, and Takashi Yoneyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

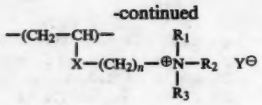
Filed Mar. 21, 1988, Ser. No. 170,225
Claims priority, application Japan, Mar. 19, 1987, 62-62712
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[4] G11B 5/64
U.S. Cl. 428—323 10 Claims

1. A magnetic recording medium comprising a support having provided on one surface thereof a magnetic recording layer and on the other surface thereof a backing layer containing non-magnetic particles dispersed in a binder, wherein said binder comprises a vinyl chloride/vinyl acetate copolymer resin containing at least one group represented by formula (I) or (II):



(I)

-continued



(II)

wherein X represents a —COO— group, a —CONH— group, or a —C_6H_4—group; n represents an integer of from 1 to 10; R_1, R_2, and R_3 each represents a hydrogen atom, an alkyl group having from 1 to 10 carbon atoms, or an alkyl derivative having from 1 to 10 carbon atoms, or R_1, R_2 and R_3 may be combined to each other to form a heterocyclic ring; and Y^{β} represents a halogen atom, $ClO_4^{\ominus}$, or $HgI_3^{\ominus}$; or $Y^{\ominus}$ is bound to R_2, R_2 represents an alkylene group having from 1 to 10 carbon atoms, and $Y^{\ominus}$ represents a $—COO^{\ominus}$ group, an $—SO_3^{\ominus}$ group, or an $—OSO_3^{\ominus}$ group; and wherein said copolymer resin contains from 60 to 95 wt % of a vinyl chloride unit and greater than 0 wt % of a vinyl acetate unit based on the total amount of said polymer r®sin; and wherein the amine content of said copolymer resin is from 0.01 to 4 wt % in terms of the nitrogen content based on the total amount of said copolymer resin; and wherein said copolymer resin has a degree of polymerization of from 100 to 700.

4,880,694

MAGNETO-OPTICAL RECORDING MATERIAL

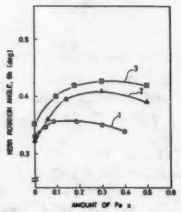
Shinji Takayama, Mitaka; Toshio Niihara, Hachioji; Katsuhiro Kaneko, Sayama, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 753,857, Jul. 11, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 145,409

Claims priority, application Japan, Jul. 11, 1984, 59-142319

Int. Cl.[4] G11B *7/24*

U.S. Cl. 428—336 **20 Claims**



1. A magneto-optical recording medium comprising a magneto-optical recording material disposed on a substrate as a thin film, said magneto-optical recording material having a composition indicated by $(Co_{1-a}M_a)_{100-y}R_y$ where M denotes a Fe and at least one element selected from the group consisting of Ni, Ag, and B; R denotes a single element selected from the group consisting of Tb, Gd, Dy and Ho; the value "a" satisfies $0 < a \leqq 0.5$, while the value of "y" satisfies $14 \leqq y \leqq 36$ in terms of atomic percent; said magneto-optical recording material being amorphous and being capable of magneto-optically recording based upon magnetic compensation temperature.

4,880,695

MOISTURE-RESISTANT, COATED THERMOPLASTIC FILM HAVING ENHANCED ADHESION TO INKS AND METALLIC LAYERS

David Rudd, Naples, N.C., and R. Scott Caines, Greenville, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 3, 1987, Ser. No. 116,106

Int. Cl.[4] B32B *7/04, 27/06, 27/36, 31/06*

U.S. Cl. 428—341 **18 Claims**

1. A moisture-resistant, coated thermoplastic film comprising:

(i) an oriented thermoplastic film; and

(ii) a moisture-resistant coating on at least one side of said film, said coating having been applied to said film by sequentially coating said film with at least two aqueous solutions, one of which contains a precursor A and the other solution containing precursor B, such that A and B react to form at least one alkaline earth salt of a fatty acid having 10 to 18 carbon atoms upon said film which is less water-soluble than either A or B.

4,880,696

FLEXIBLE PACKAGING MATERIAL CONTAINING AN ANTIOXIDANT

Apostol Yanidis, Berkeley, Calif., assignor to James River II, Inc., Oakland, Calif.

Filed Jun. 27, 1988, Ser. No. 211,942

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—349 **13 Claims**

9. In a flexible packaging material comprising a substrate extrusion coated with a polymer composition comprising an outer heatseal layer and an inner polymer layer, the improvement wherein the inner polymer layer contains a butylated phenolic antioxidant.

4,880,697

BARRIER FILM

Janice D. Caldwell, Henrico County, and Walter H. Knox, III, Rockingham County, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jun. 21, 1988, Ser. No. 209,435

Int. Cl.[4] B29D *22/00*

U.S. Cl. 428—35.4 **21 Claims**

1. A laminated plastics resin film comprising a pair of adhesively bonded coextrusions, the first of said coextrusions being biaxially oriented and having the form A—B or A—B—C and the second of said coextrusions having the form D—E—F—E—G, wherein:

Layer A is an ethylene-propylene copolymer;

Layer B is a polypropylene homopolymer;

Layer C is an ethylene-propylene copolymer;

Layer D is an propylene-ethylene random copolymer;

Layer E is a chemically modified polyolefin-polypropylene resin;

Layer F is an ethylene-vinyl alcohol copolymer; and

Layer G is a propylene-ethylene random copolymer;

and wherein said coextrusions are bonded to one another at their B or C and D layers with a thermoset adhesive.

4,880,698

COATED FLAT GLASS

Jean-Francois Thomas, Ottignies; Robert Terneu, Thiméon; Albert Van Cauter, Charleroi, and Robert Van Laethem, Loverval-Gerpinnes, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Nov. 14, 1986, Ser. No. 930,758

Claims priority, application United Kingdom, Dec. 20, 1985, 8531423; Dec. 20, 1985, 8531424; Dec. 20, 1985, 8531425

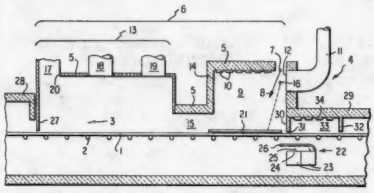
Int. Cl.[4] B32B *17/06*; B05D *5/06*

U.S. Cl. 428—333 **20 Claims**

1. Flat glass bearing a tin oxide coating layer comprising generally perpendicularly oriented crystals, characterised in

that such tin oxide layer is at least 200 nm thick and in that the expected grain area of a representative sample of the tin oxide coating crystals measured in units of 10^{-4} μm^2 is numerically equal to a value of at least 0.4 times the layer thickness measured in nanometers.

10. Flat glass bearing a tin oxide coating layer comprising generally perpendicularly oriented crystals, characterized in that such tin oxide layer is at least 200 nm thick and in that the expected grain area of a representative sample of the tin oxide



coating crystals measured in units of 10^{-4} μm^2 is numerically equal to a value of at least 0.4 times the layer thickness measured in nanometers, wherein said tin oxide layer is formed on said flat glass by a layer deposited pyrolization process which includes the steps of: spraying a coating precursor material in the form of droplets into a chamber through which hot glass passes; evaporating at least a part of the precursor material before that material contacts the glass; and causing a current of gas loaded with precursor material vapor to flow along the glass and in contact therewith.

4,880,699

ULTRATHIN POLYIMIDE POLYMER FILMS AND THEIR PREPARATION

Rachel S. Kohn, Springfield, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 267,712, Nov. 4, 1988, abandoned, which is a continuation of Ser. No. 149,829, Jan. 29, 1988, abandoned, which is a division of Ser. No. 917,731, Oct. 10, 1988, Pat. No. 4,746,474. This application Apr. 17, 1989, Ser. No. 339,903

Int. Cl.[4] B29C *41/12*

U.S. Cl. 428—333 **13 Claims**

1. A pinhole-free, polyimide polymer film having a thickness of about 400 angstroms or less.

4,880,700

NOVEL ORIENTED POLYESTER FILM COMPOSITES

Dominique Charmot, Paris, and Pierre Grosjean, Sainte-Foy Les Lyon, both of France, assignors to Rhone-Poulenc Films, Courbevoie, France

Filed Aug. 12, 1987, Ser. No. 84,219

Claims priority, application France, Aug. 12, 1986, 86 11788

Int. Cl.[4] B32B *27/08, 27/10, 27/36*

U.S. Cl. 428—337 **25 Claims**

1. A shaped article comprising an oriented linear polyester film having, on at least one of the face surfaces thereof, an adhesive primer coating which comprises a layer of a modified polymer produced by aqueous phase radical polymerization of at least one acrylic monomer in the presence of an effective amount of a water-dispersible polyester of at least one aromatic dicarboxylic acid and at least one aliphatic diol, and containing a plurality of sulfonyloxy groups of the general formula:

$$(-SO_3-)_nM \qquad (I)$$

in which M is a hydrogen atom, an alkali or alkaline earth metal, or an ammonium or quaternary ammonium residue, and n is equal to 1 or 2.

2. The shaped article as defined by claim **1**, said polyester base film comprising a polyethylene terephthalate film having a thickness of 5 to 300 micrometers.

4,880,701

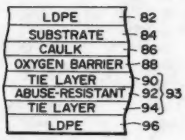
OXYGEN IMPERMEABLE LEAK FREE CONTAINER

Charles E. Gibbons; Gerald A. Marano; James M. Kittrell; Allan A. Whillock; Robert L. Lanham, all of Mobile, and Donald Evans, South Mobile, all of Ala., assignors to International Paper Company, Purchase, N.Y.

Filed May 9, 1988, Ser. No. 191,989

Int. Cl.[4] B65D *15/22;* B32B *27/00*

U.S. Cl. 428—34.2 **24 Claims**



1. An oxygen barrier laminate structure for producing an oxygen impermeable leak free container comprising:

(a) a mechanically stable structural substrate having an inner and an outer surface;

(b) an outer layer of a heat-sealable low density polyethylene polymer coated on said outer surface of said mechanically stable structural substrate;

(c) an inner layer of a first caulking polymer resin coated on said inner surface of said mechanically stable structural substrate;

(d) an inner oxygen barrier material layer coated on the inner surface of said inner layer of said caulking polymer resin;

(e) an inner sandwich layer of: a first adhesive tie layer, an abuse resistant polymer, and a second adhesive tie layer, coated in the sequence listed on the inner surface of said inner layer of said oxygen barrier material; and

(f) a product contact layer of a low density polyethylene polymer extrusion coated on the inner surface of said inner sandwich layer, which is heat-sealable with the outer layer of low density polyethylene polymer on conventional equipment at temperatures ranging from 250° F. to 500° F. and wherein said caulking polymer resin is selected from the group consisting of zinc salts of ethylene methacrylic acid copolymers, sodium salts of ethylene methacrylic acid copolymers, ethylene acrylic acid copolymers, ethylene methacrylic acid copolymers, ethylene vinyl acetate copolymers, and ethylene methacrylate copolymers.

4,880,702

THREE LAYER COMPOSITION FOR STABLIZING A DENTURE

Morio Homan, Sakai; Nizo Sugie, Hachiouji; Masakiyo Yoshimura, Kawachinagano, and Yoshikazu Shirakawa, Yamatokooriyama, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 136,633

Claims priority, application Japan, Dec. 26, 1986, 61-311088

Int. Cl.[4] C09J *7/00;* A61C *13/23;* A61K *6/00*

U.S. Cl. 428—354 **10 Claims**

1. A composition for stabilizing a denture in the form of the thin strip consisting of three layers, piled up one over another, which composition consists essentially of:

(a) two outside layers which consist essentially of a polymer in an amount sufficient to adhere each of said outside layers to gums and a denture base after contact with water or saliva, said polymer being selected from the group consisting of polyethylene oxide having an average mo-

lecular weight of about 200,000 to 10,000,000, sodium carboxymethyl cellulose and polyvinyl alcohol and mixtures of these polymers, provided that if sodium carboxymethyl cellulose is used, its content should be less than 20% by weight of the total weight of the present composition; and

(b) an inside layer which consists essentially of microcrystalline wax in an amount sufficient to impart a self-supporting ability and to retard swelling and dissolution of said inside layer and a polymer in an amount sufficient to adhere said inside layer to gums and a denture base, after contact with water or saliva when said outside layers have been dissolved, said polymer being selected from the group consisting of polyethylene oxide having an average molecular weight of about 2,000,000 to 10,000,000, sodium carboxymethyl cellulose and polyvinyl alcohol and mixtures of these polymers;

(i) said outside layers having a thickness of about 0.03 to 0.2 mm and said inside layer having a thickness of about 0.2 to 0.8 mm;

(ii) said film strip having a thickness of about 0.3 to 1.0 mm and width of about 3 to 10 mm;

(iii) the swelling ability and solubility of said outside layers being higher than those of said inside layer;

(iv) the swelled outside layers having an ability to adhere to gums and a denture base;

(v) said inside layer having a self-supporting ability and a shape-retaining ability for said outside layers; and

(vi) said inside layer having an ability to adhere to the gums and the denture base after said outside layers have dissolved.

4,880,703

ACICULAR ELECTROCONDUCTIVE TITANIUM OXIDE AND PROCESS FOR PRODUCING SAME

Masashi Sakamoto; Haruo Okuda; Hideo Takahashi, and Eiji Yamada, all of Yokkaichi, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Nov. 9, 1987, Ser. No. 118,037

Claims priority, application Japan, Nov. 11, 1986, 61-268084

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—378 **1 Claim**

1. An electroconductive titanium oxide which comprises an acicular titanium oxide having a length of 1 to 10 μm and an aspect ratio of 3 or higher, and containing up to 1% by weight of a phosphorus compound as P_2O_5 and up to 0.2% by weight of a compound of a metal having a valence of 3 or less as an oxide of the metal, said acicular titanium oxide having on the surface thereof an electroconductive layer comprising tin oxide in an amount of 1 to 50% by weight of the substrate as SnO_2, and antimony oxide in an amount of 5 to 30% by weight of the tin oxide as Sb_2O_3.

4,880,704

ORGANIC REINFORCING FIBERS WITH BUNDLE SEPARATION DURING FIBER CUTTING AND STORAGE

Colleen W. Cordova, and David S. Cordova, both of Midlothian, Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 28, 1988, Ser. No. 174,044

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—395 **14 Claims**

1. A high tenacity reinforcing fiber having improved partitioning properties selected from the group consisting of polyester, aliphatic polyamide, and combinations thereof, for reinforcing plastic composites, said fiber being coated to enhance stiffness of the fiber for cutting with

(a) 3 to 12 weight percent, based on weight of fiber of carboxyl-terminated, oil-free alkyd resin which is the reaction product of at least one aliphatic glycol containing 2 to 12 carbons with a combination of aromatic di- or trifunctional carboxylic acids and, optionally, an unsaturated aliphatic carboxylic acid, said resin having a degree of esterification below the gel point of the resin., and

(b) 0.5 to 2 weight percent vinyl chloride copolymer having a glass transition temperature of greater than about 60° C.

4,880,705

SILOXY KETENES AND PRODUCTS PREPARED THEREFROM

Bradford B. Wright, North St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 101,589, Sep. 28, 1987, Pat. No. 4,812,214.

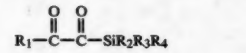
This application Dec. 22, 1988, Ser. No. 289,987

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—447 **11 Claims**

1. The siloxy-containing products produced by the method comprising the steps of:

(a) subjecting a silyl diketone to photolysis under temperature conditions of from −20° to 50° C. effective for generating a siloxy ketene intermediate therefrom, said silyl diketone having the formula



wherein Si is silicon, R_1 and R_4 are hydrocarbon groups containing from 1 to 18 carbons, and R_2 and R_3 are hydrocarbon groups containing from 1 to 6 carbons, said photolysis being carried out by irradiating said silyl diketone with light of a wavelength from 200 to 800 nm; and thereafter,

(b) contacting the generated siloxy ketene intermediate with a ketene-reactive compound under temperature conditions of from about −20° to 50° C. effective for reaction therewith, said compound being selected from the group consisting of (i) a diene polymer containing a plurality of unsaturated carbon bonds, (ii) an alkylene or cycloalkylene compound containing at least one unsaturated linkage; and (iii) an aldehyde containing one or more aldehyde groups.

4,880,706

BIAXIALLY ORIENTED MULTILAYER BARRIER FILMS

Gonzalo E. Mazuera, Farmington, and John R. Wagner, Jr., Rochester, both of N.Y., assignors to Mobil Oil Corp., New York, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,073

Int. Cl.[4] B32B *27/08;* B29F *3/06*

U.S. Cl. 428—516 **9 Claims**

1. A multilayer coextruded film which has been biaxially oriented from greater than 4:1 to about 7:1 in the machine direction and from greater than 7:1 to about 10:1 in the transverse direction, comprising:

(1) at least one (C) layer of an ethylene vinyl alcohol copolymer, and

(2) at least two (A) layers of polyethylene, polypropylene, poly (alpha-methylpentene), or copolymers of ethylene and higher olefins on opposite sides of sides (C) layer.

4,880,707

STICK OF COMPOSITE MATERIALS AND PROCESS FOR PREPARATION THEREOF

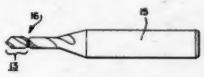
Yuichiro Kohno, and Akio Hara, both of Itami, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Continuation of Ser. No. 110,022, Oct. 15, 1987, abandoned, which is a continuation of Ser. No. 743,387, Jun. 11, 1985, abandoned. This application Aug. 10, 1988, Ser. No. 231,644

Claims priority, application Japan, Jun. 12, 1984, 59-120218; Jun. 12, 1984, 59-120219; Aug. 2, 1984, 59-163095; Mar. 13, 1985, 60-49559

Int. Cl.[4] C22C *29/16*

U.S. Cl. 428—565 21 Claims



1. A stick of composite materials comprising a hot-pressed super-hard head member and a supporting member, said head member containing higher than 50 vol % of a diamond powder and/or a high pressure boron nitride powder, and said supporting member being bonded at one of its ends with said hot-pressed super-hard head member, said stick of composite materials being characterized in that:

said hot pressed super-hard head member and said supporting member are bonded together during the hot press process of said hot-pressed super-hard head member;

the stick is of an elongated form having a sectional diameter or an equivalent sectional diameter not larger than 3 mm. the length of the hot-pressed super-hard head member is 0.3 to 2.0 mm in the axial direction of the stick; and

the supporting member is more than five times longer in its axial direction than the hot-pressed super-hard head member, the supporting member further having an axial length of at least 10 mm. after said stick is hot-pressed.

4,880,708

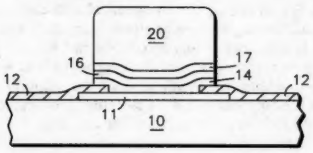
METALLIZATION SCHEME PROVIDING ADHESION AND BARRIER PROPERTIES

Ravinder K. Sharma, Mesa; Harry J. Geyer, Phoenix, and Douglas G. Mitchell, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1988, Ser. No. 215,108

Int. Cl.[4] H01L *21/48, 21/28, 21/308*

U.S. Cl. 428—620 12 Claims



1. A structure providing adhesion and barrier properties to a semiconductor substrate having a surface and a first conductor layer disposed on at least a portion of the surface of the semiconductor substrate, comprising:

a passivation layer disposed on the surface of the substrate and the first conductor layer, and having at least one opening to the first conductor layer;

a second conductor layer made of titanium-tungsten-nitride disposed on the first conductor layer through the opening of the passivation layer, and disposed on at least a portion of the passivation layer;

a third conductor layer made of titanium-tungsten disposed on the second conductor layer, and;

a fourth conductor layer made of a conductive metal disposed on the third conductor layer.

4,880,709

WELDED ALUMINUM ALLOY COMPOSITE

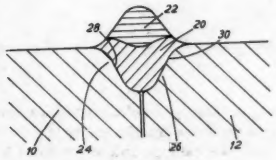
Nigel J. H. Holroyd, Brackley; Warren Hepples, and Geoffrey M. Scamans, both of Oxon, all of England, assignors to Alcan International Limited, Montreal, Canada

Filed Sep. 24, 1987, Ser. No. 100,585

Claims priority, application United Kingdom, Sep. 26, 1986, 8623160

Int. Cl.[4] B32B *15/20*

U.S. Cl. 428—654 5 Claims



1. A welded structure of two Al alloy components joined together by means of a a weld bead of a filler metal, a white zone being present in a region of a first component adjacent a first component/weld bead boundary, wherein the filler metal of the weld bead comprises an Al alloy containing at least one of Ga, In or Sn in an amount such that the potential of the weld bead is more negative than that of the metal in the white zone, the filler metal being derived from an alloy wire containing from 0.01 to 0.5% of a metal selected from the class consisting of Ga, In and Sn.

4,880,710

ATMOSPHERIC OXYGEN ELEMENT WITH REGENERATING MANGANESE CHLORIDE SOLUTION AS ELECTROLYTE

Bruno Siller, Burgundstrasse 5, D-7090 Ellwangen, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 212,182

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1987, 3720962

Int. Cl.[4] H01M *12/06*

U.S. Cl. 429—13 5 Claims

1. A process for generating $MnCl_2$ in the electrolyte of the cathode of an atmospheric oxygen element having an aqueous $MnCl_2$ electrolyte and a Zn electrode, comprising the steps of:

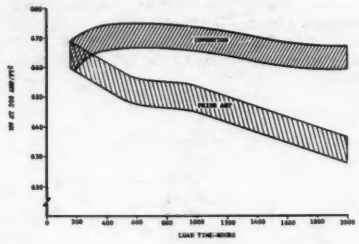
(a) precipitating a manganese (II) salt solution by adding one equivalent of hydroxide for every equivalent of Mn++ in the presence of oxygen, whereby water insoluble Mn_2O_3 is produced;

(b) adding said water insoluble Mn_2O_3 to the electrolyte of the cathode;

(c) producing current through said element whereby $ZnCl_2$ is produced in said electrolyte; and

(d) reacting said $ZnCl_2$ with the Mn_2O_3 added in (b), whereby $ZnMnO_3$ and $MnCl_2$ are produced and whereby the desire $MnCl_2$ is generated.

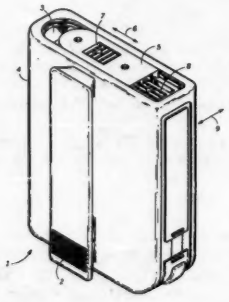
4,880,711
TERNARY FUEL CELL CATALYST CONTAINING PLATINUM AND GALLIUM
Francis J. Luczak, Glastonbury, and Douglas A. Landsman, Hartford, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.
Division of Ser. No. 121,009, Nov. 16, 1987, Pat. No. 4,806,515. This application Oct. 19, 1988, Ser. No. 259,669
Int. Cl.[4] H01M *4/92*
U.S. Cl. 429—40 **5 Claims**



1. Method of enhancing the electrochemical conversions of fuel and oxygen to water and electricity in a fuel cell, which includes at least one cathode and at least one anode which comprises:

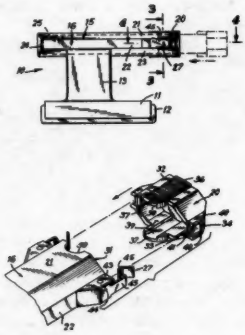
contacting the reactants with a catalyst, at said at least one cathode, consisting essentially of at least 50 atomic % platinum, gallium and at least one material selected from the group consisting of chromium, cobalt, nickel and mixtures thereof.

4,880,712
BATTERY HOUSING
Richard J. Gordecki, Ocean Ridge, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 8, 1988, Ser. No. 320,434
Int. Cl.[4] H01M *2/10*
U.S. Cl. 429—97 **8 Claims**



1. A battery housing for a battery-powered electrical product having an opening for inserting and removing the battery into and from the housing, wherein the housing comprises a cover slidably movable between a first position where it closes off the opening and a second position where it leaves the opening accessible, and locking means slidably movable transversely to the cover movement between a first position where it locks the cover in its first position and a second position where it allows the cover to move to its second position.

4,880,713
RELEASABLE BATTERY PACK CAP AND HOLDER
Morris M. Levine, Scarsdale, N.Y., assignor to International Consumer Brands, Inc., Trumbull, Conn.
Filed Nov. 5, 1987, Ser. No. 117,701
Int. Cl.[4] H01M *2/10, 6/42*; H01R *11/00*
U.S. Cl. 429—100 **12 Claims**



1. A releasable battery pack holder for a battery operated power tool comprising in combination, housing means including a chamber for receiving a battery pack, separate cap means having a cavity formed therein for receiving at least a portion of said battery pack therein, said cavity being configured to snugly but releasably secure a battery pack therein so that the battery pack can be removed from said chamber by gripping said cap means and pulling the battery therefrom without the battery becoming released from the cap, and means for releasably mounting said cap to said housing when the battery pack is in said chamber.

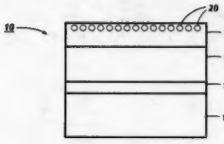
4,880,714
METHOD FOR PREPARING NON-AQUEOUS ELECTROLYTES
William L. Bowden, Nashua, N.H., assignor to Duracell Inc., Bethel, Conn.
Filed Feb. 27, 1989, Ser. No. 316,355
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—197 **17 Claims**

1. A method for preparing an improved electrolyte containing $LiPF_6$ for use in an electrochemical cell comprising dissolving a salt, having a cation comprising an adduct of a proton and a Lewis base, and an anion comprising PF_6^-, in a solvent comprising an ether capable of forming an isolatable complex with $LiPF_6$; adding a lithium base to the solution whereby $LiPF_6$ and the complex of $LiPF_6$ and ether are formed simultaneously; and isolating the $LiPF_6$-ether complex.

4,880,715
IMAGING SYSTEM
Man C. Tam, Mississauga, Canada; Robert W. Gundlach, Victr, N.Y., and Arnold L. Pundsack, Georgetown, Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed Jan. 4, 1988, Ser. No. 140,860
Int. Cl.[4] G03G *13/22*
U.S. Cl. 430—41 **18 Claims**

1. A migration imaging member comprising a substrate, an intermediate layer selected from the group consisting of an adhesive layer, a charge transport spacing layer and a combination of said adhesive layer and said charge transport spacing layer, and an electrically insulating softenable layer having an imaging surface overlying said intermediate layer, said charge

transport spacing layer comprising charge transport molecules, said electrically insulating softenable layer comprising charge transport molecules and a fracturable layer of closely spaced electrically photosensitive migration marking particles located substantially at or near said imaging surface of said electrically insulating layer, said charge transport molecules being capable of increasing charge injection from said electrically photosensitive migration marking material to said electrically insulating layer, being capable of transporting charge to said substrate and being dissolved or molecularly dispersed in



said electrically insulating softenable layer and in said charge transport spacing layer;

wherein the imaging member is capable of forming an image thereon comprising (A) a fracturable layer of closely spaced migration marking particles in an imagewise pattern located substantially at or near the imaging surface of the softenable layer; and (B) agglomerated and coalesced migration marking particles located substantially within the softenable layer in a pattern adjacent to and complimentary with the imagewise pattern of closely spaced migration marking particles.

4,880,716

ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR HAVING RESIN OUTER LAYER

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 10, 1988, Ser. No. 154,547

Claims priority, application Japan, Feb. 12, 1987, 62-28345; Sep. 11, 1987, 62-226694

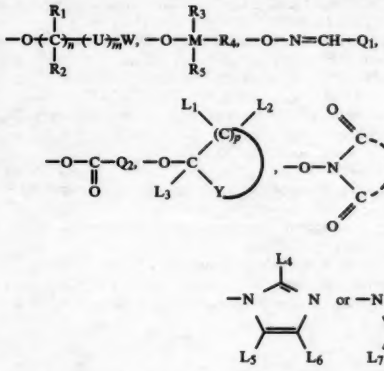
Int. Cl.[4] G03G 5/14, 13/26

U.S. Cl. 430—49 **16 Claims**

1. An electrophotographic lithographic printing plate precursor comprising a conductive support having provided thereon at least one photoconductive layer and further provided thereon an outermost surface layer, in which said surface layer contains at least one resin having at least one functional group capable of forming a carboxyl group upon decomposition which is represented by formula (I):

(I)

wherein X represents



wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom or an aliphatic group; U represents an aromatic ring; W represents a hydrogen atom, a halogen atom, a trihalomethyl group, an alkyl group, —CN, —NO_2, —SO_2R_6, —$COOR_7$ or —O—R_8, wherein R_6, R_7, and R_8 each represents a hydrocarbon group; n and m each represents 0, 1 or 2; R_3, R_4, and R_5, which may be the same or different, each represents a hydrocarbon group or —O—R_9, wherein R_9 represents a hydrocarbon group; M represents Si, Sn or Ti; Q_1 and Q_2 each represents a hydrocarbon group; Y represents an oxygen atom or a sulfur atom; L_1, L_2, and L_3, which may be the same or different, each represents a hydrogen atom or an aliphatic group; p represents 3 or 4; Z represents an organic residue forming a cyclic imide group; and L_4, L_5, L_6, L_7, and L_8, which may be the same or different, each represents a hydrogen atom or an aliphatic group; or L_5 and L_6, or L_7 and L_8 are connected to each other, respectively, to form a condensed ring.

4,880,717

PHOTOSENSITIVE BODY FOR ELECTROPHOTOGRAPHY WITH PROTECTIVE AND INTERMEDIATE LAYERS

Seizo Kitagawa, and Mitsuru Narita, both of Matumoto, Japan, assignors to Fuji Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 192,470, May 10, 1988. This application Nov. 14, 1988, Ser. No. 271,004

Claims priority, application Japan, Jun. 6, 1987, 62-144546; Nov. 16, 1987, 62-288713

Int. Cl.[4] G03G 5/14

U.S. Cl. 430—58 **16 Claims**

1. A photosensitive body for electrophotography, comprising in sequence:

a conductive substrate;

a charge transfer layer comprising selenium;

a chargeable layer comprising selenium;

an intermediate layer; and

a surface protective layer,

wherein the surface protective layer has a coefficient of thermal expansion, different than that of the chargeable layer, and the coefficient of thermal expansion of the intermediate layer changes on a gradient across the section of the intermediate layer from a value substantially equal to that of the chargeable layer at an edge of the intermediate layer adjacent the chargeable layer, to a value substantially equal to that of the surface protective layer at an edge of the intermediate layer adjacent the surface protective layer.

4,880,718

ELECTROPHOTOGRAPHIC RECORDING ELEMENT WITH ISOINDOLENINE DERIVATIVES

Reinhold J. Leyrer, Ludwigshafen, and Peter Neumann, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 274,969

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 3740420

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—58 **22 Claims**

1. An electrophotographic recording element comprising

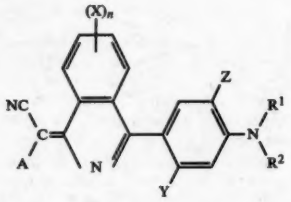
(A) an electrically conducting base and

(B) at least one layer consisting essentially of

(b_1) at least one binder,

(b_2) at least one sensitizer which on exposure of layer

(B) generates charge carriers and which is selected from the group of the isoindolenine dyes of the general structure I



where the index and the variables are defined as follows:

A is cyano, carbo-C_1–C_4–alkoxy, carbamoyl, N–C_1–C_4–alkylcarbamoyl, N–C_1–C_4–alkylcarbamoyl where the alkyl is substituted by C_1–C_4–alkoxy, N-phenylcarbamoyl, N-phenylcarbamoyl where the phenyl is substituted by C_1–C_4–alkyl or C_1–C_4–alkoxy, or is acetyl, benzoyl, 4-nitrophenyl or 4-cyanophenyl,

X is hydrogen, chlorine, C_1–C4–alkyl or C_1–C_4–alkoxy, it being possible when n = 2 for the substituents to be identical or different,

n is 1 or 2,

R^1 is hydrogen, methyl, ethyl or 2-hydroxyethyl and

R^2 is phenyl, C_1–C_4–alkyl–or C_1–C_4–alkoxysubstituted phenyl or cyclohexyl, or

R^1 is hydrogen and

R^2 is C_1–C_4–alkyl, or

R^1 and R^2 are each C_1–C_6–alkyl, C_1–C_4–alkyl which is substituted by chlorine, cyano, hydroxyl, C_1–C_4–alkoxy, phenoxy, C_2–C_5–alkanoyloxy, C_2–C_5alkanoyloxy which is substituted by C_1–C_4–alkoxy or phenoxy, or carbo–C–1–C4–alkoxy, or are each allyl or phenyl–C_1–C4–alkyl, or the group

is a saturated or unsaturated heterocyclic five-membered ring, a saturated or unsaturated heterocyclic six-membered ring, a saturated or unsaturated heterocyclic five- or six-membered ring which each additionally contains an oxygen atom or a further nitrogen atom,

Y is hydrogen, hydroxyl, methyl or ethyl,

Y is

where R^3 is linear or branched C_1–C_{12}–alkyl, phenyl or C_1–C_4–alkyl–or C_1–C_4–alkoxy-substituted phenyl,

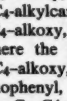
where R^4 is hydrogen or C_1–C4–alkyl and R^5 has the following meanings: hydrogen, linear or branched C_1–C_1.2–alkyl, trifluoromethyl, chloromethyl, C_1–C_4–alkoxymethyl, phenoxymethyl, phenoxymethyl with one of the following substituent$ in the phenoxy group: chlorine, methoxy, nitro or C_1–C_4–alkyl, phenoxymethyl with two substituents selected from the group consisting of chlorine, methoxy, nitro and C_1–C_4–alkyl in the phenoxy group, phenylthiomethyl, phenylthiomethyl where the phenyl is substituted by C_1–C_4–alkyl, benzyl, phenylethyl, C_3–C7–cycloalkyl, phenyl, C_1–C_{12}–alkyl-, C_1–C_{12}–alkoxy–or nitro-substituted phenyl, H_5C_6—CH=CH—, or —CH_2—$PO(OR^6)_2$, where R^6 is C_1–C_4–alkyl, or

Y is

where R^4 is as defined above and R^7 is C_1–C_{12}–alkyl, phenyl or C_1–C_{12}–alkylphenyl, or

Y is N–C1–C_4–alkylamino when R^1 and R^2 are each C_1–C–4–alkyl, or

Y is N,N–di–C_1–C4–alkylamino, N-pyrrolidinyl, N-piperidinyl or N-morpholinyl, when



has the same meaning, and

Z is hydrogen or if R^1 and R^2 are each C_1–C_4alkyl or allyl and Y is

also methoxy or ethoxy, and

(b_3) at least one photoconductor which transports the generated charge carriers.

8. The electrophotographic recording element as claimed in claim 1, wherein layer (B) is a double layer consisting of an isoindolenine dye I-containing sensitizer layer (b_2) and a layer containing a binder (b_1) and photoconductor (b_3).

4,880,719

TWO COMPONENT ELECTROPHOTOGRAPHIC DEVELOPER

Toshiaki Murofushi; Hiroshi Nakazawa; Koichi Oyamada; Shigeo Aonuma; Yoshimi Amagai, and Yasuhiro Ohya, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 212,983

Claims priority, application Japan, Jul. 3, 1987, 62-165167

Int. Cl.[4] G03G *9/10, 9/14*

U.S. Cl. 430—106.6 **8 Claims**

1. An electrophotographic two-component system developer comprising a positive charging toner comprising a colorant in a binder resin, hydrophilic alumina particles externally added onto the surface of the toner, and a negative charging carrier comprising a magnetic powder dispersed in a binder resin, wherein said hydrophilic alumina particles are adhered

onto the surface of said positive charging toner and the negative charging carrier has a volume average particle diameter of from 30 to 80 μm.

4,880,720

LIQUID DEVELOPER COMPOSITIONS

Stephan Drappel, Toronto; Raymond W. Wong, Mississauga, and Melvin D. Croucher, Oakville, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 23, 1988, Ser. No. 197,132
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—115 37 Claims

1. An electrophotographic liquid developer composition comprising a liquid medium, first toner particles charged to one polarity and comprising a resin and a first pigment, second toner particles charged to a polarity opposite to that of the first toner particles and comprising a resin and a second pigment different in color from the first pigment, and a charge director, wherein the first toner particles and the second toner particles are contained within the liquid medium.

4,880,721

LIGHT-SENSITIVE DUAL-WALLED MICROCAPSULE CONTAINING POLYMERIZABLE COMPOUND AND SILVER HALIDE, AND LIGHT-SENSITIVE MATERIAL EMPLOYING THE SAME

Shunichi Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1988, Ser. No. 186,988
Claims priority, application Japan, Apr. 28, 1987, 62-105099
Int. Cl.[4] G03C 1/72, 7/00
U.S. Cl. 430—138 16 Claims

1. A light-sensitive microcapsule containing an ethylenically unsaturated polymerizable compound which is enclosed with an inner shell of a polyurea resin or a polyurethane resin which is surrounded by an outer shell of an amino-aldehyde resin, wherein the inner shell contains silver halide grains.

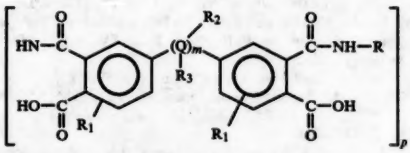
4,880,722

DIAZOQUINONE SENSITIZED POLYAMIC ACID BASED PHOTORESIST COMPOSITIONS HAVING REDUCED DISSOLUTION RATES IN ALKALINE DEVELOPERS

Wayne M. Moreau, Wappingers Falls, and Kaolin N. Chiong, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 804,869, Dec. 5, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 107,505
Int. Cl.[4] G03C 1/60
U.S. Cl. 430—192 10 Claims

1. A composition comprising a mixture of a polyamic acid material of reduced acidity comprising a polyamic acid having the general formula



wherein Q is C or C=O, R is a divalent aromatic or aliphatic radical having no active hydrogen, R_1 is a hydrogen or an alkyl group containing 1 to 3 carbon atoms, and R_2 and R_3 are independently selected from H, CH_3, C_nH_{2n+1} where n is a positive integer, and CF_3, m is an integer from 0 to 1 and p is a positive integer, which is reacted or blended to form (a) a polyamic acid material having a level of acidity which is reduced by from about 10 to about 40 percent of the original polyamic acid and (b) a diazoquinone photosensitizer, each of (a) and (b) being present in sufficient quantity to form a photoresist composition which after radiation exposure and development in alkaline solution, produces a resist image of fine line resolution.

4,880,723

PHOTOGRAPHIC SILVER HALIDE PHOTOSENSITIVE MATERIAL

Hiroyuki Hirai, and Yoshiharu Yabuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1987, Ser. No. 14,736
Claims priority, application Japan, Feb. 13, 1986, 61-29570
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] G03C 1/50
U.S. Cl. 430—218 6 Claims

1. A process for forming an image, comprising subjecting a silver halide photosensitive material, which comprises a substantially water-insoluble basic metal compound and a water-soluble salt of the same metal ion as said basic metal compound, and said basic metal is a transition metal or an alkaline earth metal, to imagewise exposure and then to a development treatment,

wherein the developing treatment is carried out in the presence of water and a compound capable of water-mediated complexing reaction with the metal of said substantially water-insoluble basic metal compound.

4,880,724

METHOD FOR MANUFACTURE OF LITHOGRAPHIC PRINTING PLATE WITH DISPOSABLE DEVELOPER WITH SURFACTANT

Tadao Toyama; Hisao Ohba, and Kenji Kunichika, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 23, 1987, Ser. No. 136,952
Claims priority, application Japan, Dec. 23, 1986, 61-307056
Int. Cl.[4] G03F 7/08
U.S. Cl. 430—302 13 Claims

1. A method of preparing a lithographic printing plate utilizing a disposable development system which comprises the steps of, in order,

(a) imagewise exposing to an actinic light a photosensitive lithographic printing plate precursor comprising a support having a light-sensitive layer containing an o-quinone diazide compound and a alkali-soluble resin;

(b) supplying to the imagewise exposed surface of the precursor a predetermined amount of a developer comprising an alkaline aqueous solution containing from about 0.5 to about 10% by weight of an alkali metal silicate and a surfactant in an amount sufficient to have a surface tension of the developer of 50 dyne/cm or less at 25° C. and a pH of a least 10.5 to 25° C.;

(c) maintaining an amount of the developed supplied in step (b) on the precursor for a predetermined period of time to develop the light-sensitive layer;

(d) removing the developer on the precursor from the surface thereof and

(e) disposing of the developer such that the developer is not circulated for repeated use.

4,880,725

COLOR IMAGE FORMING PROCESS UTILIZING SUBSTANTIALLY WATER-INSOLUBLE BASIC METAL COMPOUNDS AND COMPLEXING COMPOUNDS

Hiroyuki Hirai, and Haruhiko Iwano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 225,576, Jul. 28, 1988, abandoned, which is a continuation of Ser. No. 21,884, Mar. 4, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 291,311

Claims priority, application Japan, Mar. 4, 1986, 61-46635; Nov. 27, 1986, 61-282260

Int. Cl.[4] G03C *1/00, 5/42, 5/26*

U.S. Cl. 430—373 6 Claims

1. A process for forming a color image, comprising subjecting an imagewise exposed color photosensitive material comprising at least a silver halide and a coupler to intensified development in the presence of a reducing agent and at least one intensifier, characterized in that

said silver halide color photosensitive material contains a substantially water-insoluble basic metal compound therein, and

a processing solution containing the intensifier further contains a complexing compound capable of complexing reaction with the metal ion of said substantially water-insoluble basic metal compound to release a base, wherein said complexing compound is selected from aromatic heterocyclic compounds having at least one —COOM group and containing a pyridine or quinoline ring, wherein M is selected from the class consisting of an alkali metal, a guanidine, an amidine and quaternary ammonium.

4,880,726

METHOD OF FORMING A COLOR IMAGE

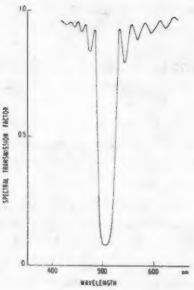
Keisuke Shiba; Seiji Ichijima; Kei Sakanoue, and Seiichi Taguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 14, 1988, Ser. No. 270,712

Claims priority, application Japan, Nov. 12, 1987, 62-285998; May 11, 1988, 63-112608

Int. Cl.[4] G03C *7/16, 7/30, 7/32*

U.S. Cl. 430—376 19 Claims



1. A method of forming a color image wherein a color print original is printed on a printing color photographic material and the thus printed material is then subjected to color development to give a color print, which is characterized in that a band stop filter having a half width of the spectral transmittance curve of said filter in a wavelength range outside the region of the maximum spectral sensitivity wavelength (λmax)$\pm$20 nm of at least one light-sensitive layer of the printing color photographic material is provided between the light source to be used in said printing step and the light-sensitive layer of said printing color photographic material, and in that a compound of a general formula (I):

$$(C_p).X \qquad (I)$$

wherein C_p represents a coupler residue capable of coupling with the oxidation product of a color developing agent to form a substantially colorless compound or a coupler residue which is coupled during a color development step to form a compound capable of being dissolved or diffused out of the layer of the photographic material; and X represents a group which is in the coupling position of the coupler and which may react with the oxidation product of a developing agent or which may react therewith to be released from the coupler, is incorporated into the light-sensitive layer of the said printing color photographic material or a taking color photographic material from which the said color print original is obtained, or into the interlayer existing between the light-sensitive layers of the said material.

4,880,727

DIRECT POSITIVE PHOTOGRAPHIC MATERIAL

Noriyuki Inoue, and Tatsuo Heki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1987, Ser. No. 101,693

Claims priority, application Japan, Sep. 26, 1986, 61-226292; Sep. 26, 1986, 61-226295

Int. Cl.[4] G03C *7/16*

U.S. Cl. 430—378 2 Claims

1. A method of forming a direct positive photographic material comprising (a) imagewise exposing to light a light-sensitive material comprising a support having provided thereon at least one internal latent image type silver halide emulsion layer which has not been previously fogged and a color image forming coupler, (b) developing the exposed material with a surface color developing solution containing an aromatic primary amine color developing agent in the presence of a nucleating agent and without exposure to light fogging, and (c) subjecting the material to bleach and fixation, wherein said light-sensitive material further comprises at least two layers containing colloidal silver and said developing solution has a pH of from 9.5 to 11.2.

4,880,728

PROCESSING METHOD FOR SILVER HALIDE COLOR PHOTOSENSITIVE MATERIALS UTILIZING THE OVERFLOW FROM THE COLOR DEVELOPER

Takatoshi Ishikawa, and Junya Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Mar. 26, 1987, Ser. No. 30,352

Claims priority, application Japan, Mar. 31, 1986, 61-73595

Int. Cl.[4] G03C *7/30, 7/42, 5/24*

U.S. Cl. 430—380 11 Claims

1. A processing method for a silver halide color photosensitive material comprising continuously treating a silver halide color photosensitive material using a multi-step processing method including (i) a step of developing the material with a color developer which is substantially free of benzyl alcohol, and (ii) at least one additional processing step subsequent to the developing step, wherein at least a part of an overflow solution of the color developer is added to the processing solution of at least one of the subsequent processing steps, and wherein the overflow solution is added in an amount of 0.1 to 30 times the

volume of color developer carried over by the photosensitive material.

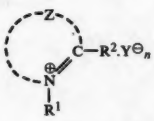
4,880,729

METHOD FOR FORMING DIRECT POSITIVE IMAGE COMPRISING DEVELOPING WITH A COMBINATION OF A NUCLEATING AGENT AND A HYDRAZINE DERIVATIVE

Tatsuo Heki; Noriyuki Inoue, and Shigeo Hirano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 1, 1987, Ser. No. 91,913
Claims priority, application Japan, Sep. 1, 1986, 61-205460
Int. Cl.[4] G03C *5/24, 1/48*
U.S. Cl. 430—410 **21 Claims**

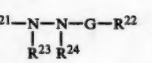
1. A method for forming a direct positive color image comprising the steps of (a) imagewise exposing a light-sensitive material comprising a support having thereon at least one photographic emulsion layer containing a nonprefogged silver halide capable of forming an internal latent image and (b) developing the exposed material in the presence of an aromatic primary amine color developing agent and a nucleating agent comprising a combination of at least one quaternary heterocyclic compound represented by formula (N-I) and at least one hydrazine compound represented by formula (N-IIa) or (N-IIb), wherein said developing step (b) is performed using a developing solution having a pH of up to about 11.2, wherein formula (N-I) is:



(N-I)

wherein Z represents a substituted or unsubstituted non-metallic group necessary for forming a quinolinium ring; R^1 represents a substituted or unsubstituted aliphatic group; R^2 represents a hydrogen atom, a substituted or unsubstituted aliphatic group, or a substituted or unsubstituted aromatic group; provided that (a) at least one of Z, R^1 and R^2 contains an alkynyl group, an acyl group, a hydrazine group or a hydrazone group, or (b) R^1 and R^2 are linked to form a 6-membered dihydropyridinium group; Y represents a counter ion necessary for charge balance; and n represents 0 or 1;

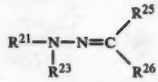
formula (N-IIa) is:



(N-IIa)

wherein R^{21} represent a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group or a substituted or unsubstituted heterocyclic group; R^{22} represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group or a substituted or unsubstituted amino group; G represents a substituted or unsubstituted carbonyl group, a substituted or unsubstituted sulfonyl group, a substituted or unsubstituted sulfoxy group, a substituted or unsubstituted phosphoryl group, or a substituted or unsubstituted iminomethylene group; at least one of R^{23} and R^{24}, which may be the same or different, represents a hydrogen atom, a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group or an acyl group; provided that G, R^{23} and R^{24} may form a hydrazone together with the hydrazine nitrogen atom;

and formula (N-IIb) is:



(N-IIb)

wherein R^{21} and R^{23} are as defined for the compounds of formula (N-IIa) and R^{25} and R^{26} are the same as R^{22} defined for the compounds of formula (N-IIa).

4,880,730

SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Kozo Sato, and Yoshisada Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 6, 1988, Ser. No. 280,412
Claims priority, application Japan, Dec. 7, 1987, 62-309344
Int. Cl.[4] G03C *1/84*
U.S. Cl. 430—520 **10 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one colored layer, and said layer can be decolored or lightened upon photographic processing of said photographic light-sensitive material,

wherein said colored layer is formed by a process comprising the step of:

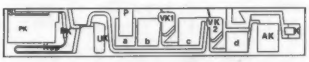
color developing at least one colorless or light-colored leuco-dyestuff utilizing at least one metal salt of an organic acid.

4,880,731

PROCESS AND REAGENT FOR THE DETERMINATION OF A REACTION PARTNER OF AN IMMUNOLOGICAL REACTION

Klaus P. Kaspar, Asuncion, Paraguay, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 25,876
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609217
Int. Cl.[4] G01N *33/543, 33/547, 33/535*
U.S. Cl. 435—7 **9 Claims**



1. In an immunoassay for the determination of an immunological reaction partner comprising:

contacting a sample suspected of containing said immunological reaction partner with (1) a labeled receptor R_1 specific to said immunological reaction partner and with (2) at least one unlabeled receptor R_2 bonded to a solid phase through substance R_3, said receptor R_2 also being specific to said immunological reaction partner;

the improvement comprising carrying out a determination of the blank value by replacing R_2 by another unlabeled receptor R_2', which does not react with the said immunological reaction partner whereby the determined blank value is used to correct for any non-specific binding.

4,880,732

PROCESS FOR THE RAPID DETERMINATION OF SPERM CELL COUNT AND/OR LIVING SPERM COUNT

István Resli; Tibor Takács; Sándor Damjanovich; Rezso Gáspár; Lajos Trón; János Szöllosi, and János Matkó, all of Debrecen, Hungary, assignors to Innofinance Altalanos Innovacios Penzintezet, Budapest, Hungary

Filed Feb. 8, 1988, Ser. No. 153,599
Int. Cl.[4] C12Q *1/02*
U.S. Cl. 435—29 3 Claims

1. A process for the rapid determination of the total cell concentration of a sperm sample, the living cell concentration of a sperm sample or both comprising:

(a) dissolving the fluorescent dyestuff propidium iodine in a buffer solution to form a dyestuff solution and measuring the fluorescent intensity, F_0;

(b) prediluting a sperm sample with buffer solution and adding the prediluted sperm sample to the dyestuff solution formed in step (a) and measuring the fluorescent intensity, F_1;

(c) adding a cytoplasm membrane-permeabilizing agent to the solution formed in step (b) and measuring the fluorescent intensity, F_3;

(d) adding to a propidium iodine dyestuff solution, as formed in step (a), an amount of buffer solution equal to the amount of prediluted sperm sample added in step (b) and a cytoplasm membrane-permeabilizing agent and measuring the fluorescent intensity, F_4;

(e) measuring the fluorescent intensity, F_5, of a pure buffer solution;

(f) adding the prediluted sperm sample to the pure buffer of step (e) and measuring the fluorescent intensity F_4

and thereafter

(1) calculating the total cell concentration from the equation:

$$\text{cell concentration} = \alpha \times \frac{(F_2 - F_3) - (F_5 - F_4)}{F_0} \text{ million/mm}^3$$

wherein α is the multiplication product from the slope of the calibration curve with the predilution ratio; and

(2) calculating the ratio of living cells to total cell concentration from the equation:

$$\text{living cell \%} = 100 - \frac{(F_1 - F_0) - (F_5 - F_4)}{(F_2 - F_3) - (F_5 - F_4)} \times 100.$$

4,880,733

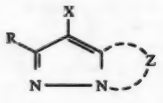
LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yutaka Kaneko, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 138,711
Claims priority, application Japan, Dec. 25, 1986, 61-315772; Dec. 26, 1986, 61-314575; Dec. 26, 1986, 61-314576; Dec. 26, 1986, 61-314577; Dec. 27, 1986, 61-314141
Int. Cl.[4] G03C *7/38*
U.S. Cl. 430—551 5 Claims

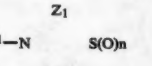
1. A silver halide photographic light-sensitive material which comprises a magenta dye-forming coupler represented by formula [M-I] and a compound represented by formula [A];

[M-I]



wherein Z represents a group of non-metal atoms necessary to complete a nitrogen-containing heterocycle which may have a substituent, X represents a hydrogen atom or a group capable of being split-off upon reaction with the oxidation product of a color developing agent and R represents a hydrogen atom or a substituent;

[A]



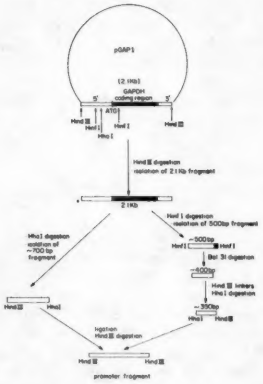
wherein R^1 represents an aryl group or heterocyclic group, Z_1 and Z_2 independently represent an alkylene group having 1 to 3 carbon atoms provided that the total number of carbon atoms within the alkylene groups represented by Z_1 and Z_2 is 3 to 6, and n is 1 or 2.

4,880,734

EUKARYOTIC REGULATABLE TRANSCRIPTION

Rae L. Burke, San Francisco; Steven Rosenberg, Oakland; Jeffrey R. Shuster, Walnut Creek; Patricia Tekamp-Olson; Pablo D. T. Valenzuela, both of San Francisco, and Philip J. Barr, Orinda, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 760,197, Jul. 29, 1985, which is a continuation-in-part of Ser. No. 468,589, Feb. 22, 1983, abandoned, and Ser. No. 609,540, May 11, 1984, abandoned.
This application May 29, 1986, Ser. No. 868,639
The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.
Int. Cl.[4] C12P *21/00, 21/02;* C12N *5/00, 15/00*
U.S. Cl. 435—68 21 Claims



1. A DNA construct comprising in order of transcription a first transcriptional regulatory region obtained from one of the yeast genes ADR3, GAL4, or the regulatory region of PHO5, which provides for inducible transcriptional regulation; a second transcriptional initiation region from the yeast GAPDH

gene of FIG. 2; a structural gene coding for other than the wild-type gene of said transcriptional initiation region; and a terminator region.

4,880,735

PROCESS FOR PRODUCING ANTIBIOTIC A47934

Jeffrey T. Fayerman; Michael D. Jones; Karl H. Michel, all of Indianapolis; Raymond C. Yao, and Milton J. Zmijewski, both of Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 24, 1986, Ser. No. 911,180

Int. Cl.[4] C12P *21/04, 17/18;* **C12R** *1/465*

U.S. Cl. 435—71 **3 Claims**

1. A biologically purified culture of the microorganism *Streptomyces toyocaensis* NRRL 18112.

2. In the process for producing antibiotic A47934, the improvement which comprises cultivating a microorganism recited in claim 1 in the culture medium containing assimilable sources of carbon and nitrogen under submerged aerobic fermentation conditions until antibiotic A47934 is produced.

4,880,736

PRODUCTION OF URIDINE

Yutaka Tsunemi; Satoru Asahi, both of Suita, and Muneharu Doi, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 18, 1985, Ser. No. 788,812

Claims priority, application Japan, Oct. 26, 1984, 59-226515

Int. Cl.[4] C12P *19/38;* **C12R** *1/07*

U.S. Cl. 435—87 **8 Claims**

1. A method of producing uridine, which comprises cultivating in a culture medium a uridine-producing mircroorganism, which is a mutant selected from the group consisting of *Bacillus subtilis* ST-58 (IFO 14387, FERM BP-855), *Bacillus subtilis* STA-17 (IFO 14388, FERM-BP-856), *Bacillus subtilis* SA-85 (IFO 14389, FERM BP-860), *Bacillus licheniformis* LA-2 (IFO 4391, FERM BP-857) and *Bacillus pumilus* PT-42 (IFO 14390, FERM BP-858) which is deficient in uridine nucleoside phosphorylase activity and is resistant to a pyrimidine analogueue, to thereby cause formation and accumulation of uridine in the resultant culture broth, and recovering the uridine from the culture broth.

4,880,737

PROCESS FOR THE PREPARATION OF L-ALPHA-AMINO ACID AND D-ALPHA-AMINO ACID AMIDE

Pieter L. Kerkhoffs, Geleen, and Wilhelmus H. J. Boesten, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Netherlands

Filed Oct. 28, 1985, Ser. No. 792,006

Claims priority, application Netherlands, Nov. 15, 1984, 8403487

Int. Cl.[4] C12P *13/04, 13/08, 13/22;* **C12N** *9/78*

U.S. Cl. 435—106 **5 Claims**

1. Process for the preparation of L-α-amino acid and D-α-amino acid amide from DL-α-amino-acid amide by contacting the DL-α-amino acid amide in an aqueous solution with an α-amino acyl amidase containing preparation obtained from a culture of *Pseudomonas putida* ATCC 12633 in the presence of traces of bivalent metal ions as activator, wherein the aqueous solution also contains a potassium salt selected from the group consisting of potassium sulphate and potassium chloride.

5. Process for the preparation of L-α-amino acid having the formula

$$R-\underset{\displaystyle NH_2}{\underset{|}{CH}}-COOH,$$

where R represents an unsubstituted or substituted alkyl or aryl group, and a D-α-amino acid amide having the formula

$$R-\underset{\displaystyle NH_2}{\underset{|}{CH}}-CONH_2,$$

where R signifies the same as above wherein:

(a) an aldehyde having the formula RCHO, where R signifies the same as above, is converted into a DL-α-amino nitrile in an aqueous ammonia solution with potassium cyanide and ammonium sulfate,

(b) a ketone and potassium hydroxide are subsequently added to the above solution containing the DL-α-amino nitrile to form DL-α-acid amide and,

(c) an α-amino acyl amidase containing preparation, obtained from a culture of *Pseudomonas putida* ATCC 12633, is added along with traces of bivalent metal ions to the solution containing the DL-α-amino acid amide.

4,880,738

PRODUCTION OF AMINO ACIDS USING COUPLED ENZYME SYSTEMS

J. David Rozzell, Cambridge, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.

Filed Jun. 13, 1986, Ser. No. 873,920

Int. Cl.[4] C12P *13/04, 13/22*

U.S. Cl. 435—106 **10 Claims**

1. A biocatalytic method for producing a desired amino acid which comprises contacting a 2-ketoacid corresponding to the desired amino acid with lactic acid, aspartic acid and ammonia, or salts thereof, in the presence of:

(a) one or more transaminase enzymes capable of catalyzing the conversion of the 2-ketoacid and L-aspartic to the desired amino acid and oxaloacetic acid;

(b) a malate-lactate transhydrogenase enzyme capable of catalyzing the conversion of lactic acid and oxaloacetic acid to pyruvic acid and malic acid;

(c) a fumarase enzyme capable of catalyzing the conversion of malic acid to fumaric acid; and

(d) an aspartate-ammonia lyase enzyme capable of catalyzing the conversion of fumaric acid and ammonia to aspartic acid;

said contacting being under suitable conditions permitting the production of the desired amino acid.

4,880,739

METHOD OF CULTIVATION OF PSEUDOMONAS BACTERIA

Hideaki Yamada, 19-1, Matsugasaki-Kinomoto-Cho, Sakyo-Ku, Kyoto-Shi; Kanehiko Enomoto, Yokohama, and Ichiro Watanabe, Yokosuka, all of Japan, assignors to Hideaki Yamada, Kyoto and Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 551,949, Nov. 15, 1983, abandoned. This application Oct. 2, 1987, Ser. No. 104,566

Claims priority, application Japan, Nov. 16, 1982, 57-199750

Int. Cl.[4] C12P *13/02;* **C12N** *1/20;* **C12K** *1/38*

U.S. Cl. 435—129 **11 Claims**

1. In a method of cultivating Pseudomonas bacteria having nitrile hydratase activity by reproducing and proliferating said bacteria in a culture medium and then using said nitrile hydratase to hydrate a nitrile to an amide, the improvement wherein at least one compound selected from the group consisting of propionitrile, isobutyronitrile, propionamide and isobutyramide is added continuously or incrementally, but not in one batch at one time, to the culture medium during the reproduction and proliferation of cells of the Pseudomonas bacteria in an amount effective to increase the nitrile hydratase activity per unit of culture fluid of the culture medium.

4,880,740

MICROBIAL REDUCTION OF IRON ORE

Michael R. Hoffmann; Robert G. Arnold, and Gregory Stephanopoulos, all of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 626,911, Jul. 2, 1984, abandoned. This application Oct. 17, 1984, Ser. No. 661,629
Int. Cl.[4] C12P *3/00*
U.S. Cl. 435—168 33 Claims

1. A process for forming and separating an iron-containing precipitate from iron ore by treatment with microorganisms comprising:

(a) forming iron ore particles which contain ferric iron;

(b) forming an aqueous mixture which comprises (i) said iron ore particles thusly formed in step (a), (ii) an effective amount of microorganisms operable for reducing said ferric iron of said iron ore particles to ferrous iron, (iii) an effective amount of a substrate operable for producing at least a major part of the energy required by said mixture to reduce at least a major part of said ferric iron of said iron ore particles to ferrous iron, said substrate being a waste product;

(c) maintaining said aqueous mixture for a predetermined period of time under conditions of temperature and pressure and under an atmospheric environment, operable for reducing at least a major part of said ferric iron of said iron ore particles to ferrous iron which is soluble in the aqueous phase of said aqueous mixture by the microbial activity of said microorganisms;

(d) separating an aqueous phase containing said soluble ferrous iron from said aqueous mixture; and

(e) forming and separating an iron-containing precipitate from said separated aqueous phase.

4,880,741

PROCESS FOR TRANSFORMATION OF *YARROWIA LIPOLYTICA*

Lance S. Davidow, Groton, and John R. DeZeeuw, Stonington, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 539,591, Oct. 6, 1983, abandoned. This application Jul. 25, 1984, Ser. No. 634,505
Int. Cl.[4] C12N *15/00, 1/16, 1/20;* C12P *19/34*
U.S. Cl. 435—172.3 87 Claims

1. A process for integrative transformation of *Yarrowia lipolytica* which comprises introducing DNA into said *Y. lipolytica*, said DNA comprising a region of homology to chromosomal DNA of said *Y. lipolytica* sufficient to result in integrative transformation thereof and containing a detectable marker.

4,880,742

PROSTAGLANDIN BIOSYNTHESIS INHIBITORS

Osamu Hayaishi; Ryuji Ueno, both of Kyoto, and Sachiko Kuno, Ibaraki, all of Japan, assignors to Research Development Corporation of Japan, Tokyo and Ueno Seiyaku Kabushikikaisha, Osaka, both of, Japan

Filed Feb. 3, 1987, Ser. No. 10,519
Claims priority, application Japan, Feb. 14, 1986, 61-31248
Int. Cl.[4] C12N *7/00;* A61K *31/19*
U.S. Cl. 435—238 1 Claim

1. A method of inhibiting proliferation of AIDS-virus producer human T-cells which comprises providing in the presence of such cells Diclofenac or a pharmaceutically acceptable salt thereof in amount cytocidally effective in response to said producer human T-cells but ineffective in respect to normal human T-cells.

4,880,743

BACTERIAL COMPOSITION FOR INHIBITING PSYCHROTROPHIC BACTERIA IN CREAM OR MILK BASED PRODUCTS

Mark A. Matrozza, Sarasota; Marianne F. Leverone, Bradenton, and Donald P. Boudreaux, Sarasota, all of Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Division of Ser. No. 103,883, Oct. 2, 1987, Pat. No. 4,790,994.
This application Jul. 27, 1988, Ser. No. 224,718
Int. Cl.[4] C12N *1/22, 1/20*
U.S. Cl. 435—252.4 9 Claims

1. A bacterial composition which comprises cells of:

(a) a lactic acid producing bacterium which generates a diacetyl flavor at refrigeration temperatures in a milk or cream based product without fermentation; and

(b) a Pediococcus which generates antimicrobial metabolites in the milk or cream based product at the refrigeration temperatures without fermentation, wherein the ratio of lactic acid producing bacteria to Pediococcus is between about 1 and 10 and 10 to 1 by cell count and wherein the product can be inoculated with an effective amount of the composition to inhibit the growth of psychrotrophic bacteria without a significant increase in the cell count at the refrigeration temperatures.

4,880,744

METHOD OF CULTURING PROTOPLASTS

Tatsuhito Fujimura, Tokyo, and Motoi Sakurai, Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,423
Claims priority, application Japan, May 21, 1985, 60-106886
Int. Cl.[4] C12N *5/02*
U.S. Cl. 435—240.46 22 Claims

1. A method of culturing protoplasts comprising: culturing protoplasts of rice at a cell density sufficient to allow growth of said protoplasts in a liquid medium having a pH effective for culturing said protoplasts which is 3.5 to 5.2 and on a hydrophilic support on which said liquid medium can spread uniformly.

4,880,745

PSEUDOMONAS GLADIOLI AND A PROCESS FOR BIOLOGICALLY CONTROLLING FUSARIUM DISEASES USING *PSEUDOMONAS GLADIOLI* PV. GLADIOLI

Toshio Kijima, Tochigi; Tokuya Tezuka, Utsunomiya; Yoji Doi, Tokyo; Shuichi Yamashita, Tokyo; Shigetoh Namba, Tokyo, and Tsutomu Arie, Hino, all of Japan, assignors to Tochigi Prefecture, Tochigi Prefecture, Japan

Filed Feb. 9, 1987, Ser. No. 12,649
Claims priority, application Japan, Aug. 9, 1986, 61-187575
Int. Cl.[4] C12R *1/38;* A01N *63/00;* A61K *37/00*
U.S. Cl. 435—253.3 2 Claims

1. A biologically pure culture of the microorganism *Pseudomonas gladioli* for biologically controlling plant disease caused by *Fusarium oxysporum*, having the identifying characteristics of Bikohken-kin No.8805, said culture having antifungal activity and also being capable of growing in a bulb and/or roots of at least a plant selected from the group consisting of Welsh onion, sorgo, oats and maize.

2. A process for biologically controlling plant disease caused by *Fusarium oxysporum* using *Pseudomonas gladioli* pv. gladioli, which comprises

a step of inoculating *Pseudomonas gladioli* M-2196 into a bulb and/or roots of at least a plant selected from the group consisting of Welsh onion, sorgo, oats and maize;

a step of planting the inoculated plants together within the radius of rhizosphere of a plant to be protected for further multiplication of *Pseudomonas gladioli* M-2196; and

a step of controlling soil borne plant disease by means of antifungal activity against *Fusarium oxysporum.*

4,880,746

STREPTOMYCETES PLASMID PSG5, A PROCESS FOR OBTAINING IT, AND ITS USE

Wolfgang Wohlleben; Agnes Schulte, and Alfred Pühler, all of Bielefeld, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 717,804, Mar. 29, 1985, abandoned.
This application Oct. 14, 1987, Ser. No. 110,105
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412093; Mar. 31, 1984, 3412092
Int. Cl.[4] C12N *1/20, 15/00;* C12P *21/00;* C12R *1/465*
U.S. Cl. 435—253.5 3 Claims

1. The plasmid pSG5 having a molecular length of about 12.7 kb, which is obtainable from a culture of *Streptomyces ghanaensis* DSM 2932.

4,880,747

FUSARIUM SPOROTRICHIOIDES MUTANT STRAIN CAPABLE OF PRODUCING BOTH DIDEACETYLCALONECTRIN AND DEACETYLCALONECTRIN

Marian N. Beremand, and Patricia J. Black, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 28, 1988, Ser. No. 173,910
Int. Cl.[4] C12N *1/14, 1/77;* C12P *5/00, 1/02*
U.S. Cl. 435—254 1 Claim

1. A *Fusarium sporotrichioides* mutant strain having the identifying characteristics of ARS Culture Collection Accession No. 18339; said strain being capable of producing dideacetylcalonectrin and deacetylcalonectrin in amounts greater than 100 μm/L.

4,880,748

METHOD FOR CONTROL OF VISBREAKER SEVERITY

Lawrence J. Altman; Byung C. Choi, both of Cherry Hill, and Grant C. Karsner, Voorhees Township, Camden County, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 22, 1988, Ser. No. 222,858
Int. Cl.[4] G01N *33/26*
U.S. Cl. 436—60 6 Claims

1. A method for rapidly determining the absence of incompatible sediment in a blended heavy fuel oil prepared by mixing a visbroken oil with sufficient cutter stock to impart to said blended fuel oil a specified viscosity, which method comprises:

preparing a sample blend containing a higher proportion of said visbroken oil than said blended heavy fuel oil:

measuring at a selected wavelength in the range of 1200 to 3000 nm the total light absorbed by said blended heavy fuel oil and by said sample blend;

and confirming the substantial absence of said incompatible sediment in said blended heavy fuel oil if the total light absorbed by said sample blend is more that absorbed by than said blended heavy fuel oil.

4,880,749

ANALYTICAL ELEMENT AND ITS USE IN A WHOLE BLOOD HEMOGLOBIN ASSAY

Brent A. Burdick; Tai-Wing Wu, both of Rochester; David A. Hilborn, Henrietta, and Richard W. Spayd, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1984, Ser. No. 617,453
Int. Cl.[4] G01N *21/78, 33/72*
U.S. Cl. 436—66 15 Claims

1. A multizone element for the determination of hemoglobin in whole blood, said element comprising, in order and in fluid contact, a registration zone comprising particulate barium sulfate distributed in a blush polymer, and a spreading zone having a void volume of from about 25 to about 80 percent and an average pore size of at least about 5 microns,

said spreading zone comprising a particulate structure comprising a plurality of particles non-swellable in and impermeable to whole blood, said particles having a particles size of from about 1 to about 200 microns and being bonded on surface areas of adjacent particles where said adjacent particles are in closest proximity to form a coherent, three-dimensional lattice which is non-swellable in whole blood,

said element also containing an interactive composition capable of converting substantially all forms of hemoglobin into a detectable species,

said interactive composition consisting essentially of either an ionic surfactant present at a coverage of from about 5 to about 12 g/m^2, or the combination of a hemoglobin oxidizing agent and thiocyanate.

11. A method for the determination of hemoglobin in whole blood, said method comprising the steps of:

(A) physically contacting a sample of whole blood and a multizone element, said element comprising, in order and in fluid contact, a registration zone comprising particulate barium sulfate distributed in a blush polymer, and a spreading zone having a void volume of from about 25 to about 80 percent and an average pore size of at least about 5 microns,

said spreading zone comprising a particulate structure comprising a plurality of particles non-swellable in and impermeable to whole blood, said particles having a particle size of from about 1 to about 200 microns and being bonded on surface areas of adjacent particles where said adjacent particles are in closest proximity to form a coherent, three dimensional lattice whch is non-swellable in whole blood,

said element also containing an interactive composition capable of converting substantially all forms of hemoglobin into a detectable species,

said interactive composition consisting essentially of an ionic surfactant present at a coverage of from about 5 to about 12 g/m^2, or the combination of a hemoglobin oxidizing agent and thiocyanate; and

(B) quantitatively detecting said detectable species.

4,880,750

INDIVIDUAL-SPECIFIC ANTIBODY IDENTIFICATION METHODS

Ann-Michele Francoeur, San Diego, Calif., assignor to Miragen, Inc., San Diego, Calif.

Filed Jul. 9, 1987, Ser. No. 71,707
Int. Cl.[4] G01N *33/548, 33/561, 33/566, 33/577*
U.S. Cl. 436—501 30 Claims

1. A method for identifying animals, comprising the steps of:

isolating an effective amount of individual-specific antibodies from said animals;
preparing a panel of multiple antigens separated in n dimensions on a solid surface, where n is one or two;
forming a pattern of immune complexes of said antibodies and said antigens by contacting an effective amount of said antibodies to said panel of antigens for a time sufficient for said antibodies to bind to said antigens;
revealing said pattern of immune complexes by contacting said immune complexes with an effective amount of detector antibody-binding molecules; and
comparing the revealed pattern of immune complexes with a known pattern of immune complexes for the individual animal to be identified.

4,880,751

IMMUNOGLOBULIN ADSORPTION

William D. Georgheganm, Houston, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Oct. 31, 1986, Ser. No. 926,080
Int. Cl.[4] G01N *33/53, 33/543, 33/563, 33/544*
U.S. Cl. 436—518 25 Claims

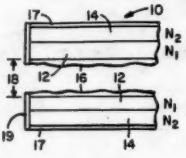
1. A method for preparing an adsorption surface by adsorbing thereon selected IgG molecules, the method comprising the steps of:
(a) selecting an adsorption surface having a net positive or negative charge;
(b) choosing an IgG species having an F(c) portion with a net pI that is basic with respect to its F(ab) portion in the case of a negatively charged surface, or an F(c) portion with a net pI that is acidic with respect to its F(ab) portion in the case of a positively charged surface;
(c) fractionating IgG moieties of the chosen IgG species to select for a population of IgG molecules having a pI range of less than or equal to approximately 2 pI units and further wherein the net pI of the selected population is acidic, in the case of negatively charged surface, or basic, in the case of a positively charged surface; and
(d) adsorbing the selected IgG population to the selected adsorption surface.

4,880,752

DIELECTRIC WAVEGUIDE SENSORS AND THEIR USE IN IMMUNOASSAYS

Donald B. Keck, Big Flats, and Walter F. Love, Horseheads, both of N.Y., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Continuation of Ser. No. 85,423, Aug. 13, 1987, abandoned, which is a continuation of Ser. No. 773,074, Sep. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 652,714, Sep. 21, 1984, abandoned. This application Feb. 24, 1989, Ser. No. 298,524
Int. Cl.[4] G01N *21/64, 33/535*
U.S. Cl. 435—7 22 Claims



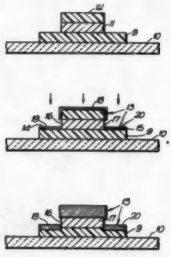
1. A dielectric waveguide for use in fluorescence assays of an analyte in a fluid, comprising:
(a) a core having an index of refraction (N_1) and an opening in the core;
(b) a cladding about the core having an index of refraction (N_2) which is less than N_1; and
(c) a reactant coating about the opening of the core which comprises an analyte-binder, wherein the core is transmissive to radiation which can excite fluorescence of a fluorescent tag and transmissive to fluorescent radiation from the fluorescent tag.

4,880,753

METHOD OF FABRICATING A POLYSILICON THIN FILM TRANSISTOR

Douglas B. Meakin, Liverpool, and Piero Migliorato, London, both of England, assignors to The General Electric Company, p.l.c., England

Filed Feb. 16, 1989, Ser. No. 311,219
Claims priority, application United Kingdom, Feb. 19, 1988, 8803924
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—41 5 Claims



1. A process for manufacturing a thin film transistor, including the steps of forming a first polysilicon layer on a substrate; forming a silicon dioxide layer on a region of said first polysilicon layer leaving exposed regions of said first polysilicon layer; forming a second polysilicon layer on said silicon dioxide layer and aligned therewith; and depositing on said second polysilicon layer and on said exposed regions of said first polysilicon layer, regions of a selectively-grown electrically-conductive film, which film will not grow on the edges of said silicon dioxide layer but will grow on said exposed polysilicon, said selectively-grown regions acting as source and drain regions and gate electrode of the thin film transistor.

4,880,754

METHOD FOR PROVIDING ENGINEERING CHANGES TO LSI PLAS

Anthony Correale, Lake Katrine, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

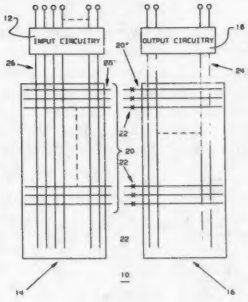
Filed Jul. 6, 1987, Ser. No. 69,915
Int. Cl.[4] H01L *21/20, 21/00*
U.S. Cl. 437—51 4 Claims

1. A method for fabricating and subsequently changing a Large Scale Integrated (LSI) circuit chip that incorporates an electronic circuit including a Programmed Logic Array (PLA) comprising the steps of:
(a) providing a set of masks including masks for contact and

metallization, designed to realize said electronic circuit in said LSI chip;

(b) providing, in said set of masks an area with a first set of images for defining the PLA and a second set of images being disposed adjacent to the first set of images with said second set of images being logically and physically isolated from said first set of images and including images for at least one additional product term, input line, or output line, and devices

(c) fabricating said chip from said set of masks;



(d) as desired to effect changes to said chip, changing the images in said masks for contacts and subsequent fabrication steps only to connect one or more of other input or output lines of said PLA to one or more of said additional input or output lines, as the case may be, or connect said additional product term to one or more input lines and one or more output lines, to realize the addition or subtraction of the devices comprising array personalization to effect said desired circuit changes; and

(e) fabricating said chip with said changed set of masks.

4,880,755

SIALON CUTTING TOOL COMPOSITION

Pankaj K. Mehrotra, Greensburgh, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 51,964, May 19, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,716

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—96 52 Claims

34. A sialon ceramic material comprising a ceramic core containing beta-prime-sialon phase, and an intergranular phase and, said sialon ceramic material having a beta-prime-sialon alloyed surface layer phase comprising an alloy of the beta prime sialon phase in said ceramic core with a substantially increased aluminum and oxygen content compared to the beta-prime-sialon in said ceramic core.

4,880,756

SILICON NITRIDE SINTERED PRODUCT

Kazuhiro Urashima; Masakazu Watanabe; Yo Tajima, and Kenji Nakanishi, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Aug. 31, 1988, Ser. No. 238,429

Claims priority, application Japan, Sep. 2, 1987, 62-219961; Apr. 15, 1988, 63-94354

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—97 2 Claims

1. A silicon nitride sintered product consisting essentially of, in % by weight:

1 to 10% Mg, calculated as MgO;

1 to 10% Zr, calculated as ZrO_2;

0.1 to 2.0% of at least one of Al, calculated as Al_2O_3, Li, calculated as Li_2O, and Na, calculated as Na_2O; and

the remainder being Si_3N_4 and unavoidable impurities.

4,880,757

CHEMICAL PREPARATION OF ZIRCONIUM-ALUMINUM-MAGNESIUM OXIDE COMPOSITES

Walter W. Henslee, Lake Jackson, and Thomas S. Witkowski, Galveston, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 24, 1986, Ser. No. 822,074

Int. Cl.[4] C04B *35/48;* C01F *7/02*

U.S. Cl. 501—104 13 Claims

1. A sinterable precursor powder convertible to zirconia-spinel ceramic composites comprised of spinel forming metal compounds intimately admixed with a zirconium compound, said powder consisting of an intimate admixture derived from intimately admixing in a liquid medium

(1) at least one decomposable salt of a metal or metals which form spinel crystal structures on calcination,

(2) a zirconium compound selected from the group consisting of

(a) a salt capable of being converted upon heating to zirconium oxide, or

(b) a fine zirconium oxide powder which admixture is co-precipitated, and the solids recovered, said metal or metals being present in mole ratios to form the spinel structure with or without an additional amount of one of the spinel forming metals to form a segregated metal oxide phase when converted and said metal/metals and said zirconium compound being present in an amount greater than 0 but less than 100% of the total weight of the composition.

4,880,758

PREPARATION OF ABO_3 COMPOUNDS FROM MIXED METAL AROMATIC COORDINATION COMPLEXES

Robert H. Heistand, II, East Walpole, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1987, Ser. No. 88,460

Int. Cl.[4] C01F *17/00;* C01G *23/00, 25/00, 27/00*

U.S. Cl. 423—21.1 27 Claims

1. A method of producing an ABO_3 powder wherein A represents a first metal ion and B represents a second metal ion, comprising:

(a) preparing a mixed metal coordination complex $[A.Q_m]$ $[B(L)_n(Ar)_o]$ wherein Q represents a solvate, m represents the number of moles of Q, L represents oxygen or —OR wherein R can be hydrogen, saturated or unsaturated acyclic or cyclic alkyl, aryl or alkaryl, n is a number representing the moles of L, Ar represents a residue of a disubstituted aromatic compound and o represents the number of moles of Ar in the coordination complex wherein o is greater than zero; and

(b) decomposing the mixed metal coordination complex $[A.Q_m]$ $[B(L)_n(Ar)_o]$ to produce an ABO_3 powder.

4,880,759

BALL CLAY SLURRY

William Kohut, Springville, Tenn., assignor to H. C. Spinks Clay Company Inc., Paris, Tenn.

Continuation-in-part of Ser. No. 99,917, Sep. 22, 1987, Pat. No. 4,812,427, which is a continuation-in-part of Ser. No. 895,815, Aug. 12, 1986, abandoned. This application Dec. 16, 1988, Ser. No. 285,640

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] C04B *33/28*

U.S. Cl. 501—148 20 Claims

1. A ball clay/water slurry, wherein:

(a) said slurry is comprised of from about 58 to about 68 percent (by total weight of slurry) of ball clay (dry basis) and from about 42 to about 32 percent (by total weight of slurry) of water;

(b) said slurry has an initial Brookfield 100 rpm viscosity of from about 100 to about 600 centipoise;

(c) from about 30 to about 45 percent (by weight of dry ball clay) of the particles in said ball clay slurry are smaller than 0.5 microns, from about 53 to about 60 percent of the ball clay slurry particles are smaller than 2 microns, and from about 70 to about 85 percent of the ball clay slurry particles are smaller than 5 microns;

(d) said slurry has a specific surface area of from about 16 to about 21 square meters per gram;

(e) said slurry, when freshly made, has a five-minute gel viscosity at 0.5 revolutions per minute of from about 1,000 to about 10,000 centipoise;

(f) said slurry, when freshly made, has a ten-minute gel viscosity of from about 2,200 to about 12,000 centipoise;

(g) said slurry, when freshly made, has a twenty-minute gel viscosity of from about 3,500 to about 14,000 centipoise;

(h) the difference between the twenty-minute gel viscosity of the slurry and its ten-minute gel viscosity is less than about 3,000 centipoise;

(i) the difference between the twenty-minute gel viscosity of the slurry and its five minute gel viscosity is less than about 4,000 centipoise;

(j) the twenty-minute gel viscosity of a three-day old sample of said slurry is no more than 50 percent greater than the twenty-minute gel viscosity of the freshly-made slurry and is from about 3,500 to about 14,000 centipoise;

(k) said slurry contains from about 0.001 to about 1.0 percent of organic polyelectrolyte (weight of active ingredient, by weight of dry ball clay) wherein said organic polyelectrolyte has a molecular weight of from about 1,400 to about 6,000;

(l) said slurry contains from about 50 to about 650 parts per million (by weight of dry ball clay) of soluble sulfate ion;

(m) said slurry has a settling index of at least about 0.9;

(n) said slurry has a flow index of from about 20 to about 30 seconds;

(o) said slurry has a casting rate of from about 30 to about 60 grams after one hour;

(p) said slurry has a transmission of at least about 60 percent;

(q) said slurry has a dry modulus of from about 550 to about 700 pounds per square inch;

(r) said slurry contains from about 50 to about 65 percent (by weight of dry ball clay) of silica and from about 20 to about 35 percent of alumina;

(s) the silica/alumina weight ratio in said slurry is from about 2.0 to about 3.0; and

(t) said slurry is comprised of from about 3 to about 20 percent (by weight of dry clay in the slurry) of mica, from about 6 to about 18 percent (by weight of dry clay in the slurry) of at least one montmorillonite mineral, from about 25 to about 70 percent (by weight of dry clay in the slurry) of at least one kaolinite mineral, and from about 7 to about 40 percent (by weight of dry clay in the slurry) of quartz.

4,880,760

DEWAXING CATALYSTS EMPLOYING NON-ZEOLITIC MOLECULAR SIEVES

Regis J. Pellet, Croton-on-Hudson; Jule A. Rabo, Armonk; Gary N. Long, Putnam Valley; Frank P. Gortsema, Pleasantville, and Albert R. Springer, Yonkers, all of N.Y., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 682,942, Dec. 18, 1984, abandoned. This application Aug. 17, 1987, Ser. No. 85,844

Int. Cl.[4] B01J *29/06, 27/18*

U.S. Cl. 502—67 26 Claims

1. A dewaxing catalyst comprising at least one NZ—MS selected from the group consisting of SAPO, ELAPSO, MeAPO, FeAPO, TiAPO and ELAPO molecular sieves characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a pressure of 500 torr and a temperature of 20° C., and at least one metal selected from the group consisting of nickel, cobalt, tungsten, molybdenum, platinum, palladium, chromium, iridium, rhodium, ruthenium and titanium.

3. The catalyst of claim 1 wherein said catalyst contains at least one zeolitic aluminosilicate selected from the group consisting of zeolite Y, ultra-stable zeolite Y, zeolite X, zeolite beta, zeolite KZ-20, faujasite, LZ-210, LZ-10, ZSM-type zeolites and mixtures thereof.

4. The catalyst of claim 3 wherein said catalyst contains from 1 to 99 percent by weight of at least one inorganic oxide matrix component.

4,880,761

CRYSTALLINE MICROPOROUS METAL SULFIDE COMPOSITIONS

Robert L. Bedard, Fishkill; Lawrence D. Vail, Tappan; Stephen T. Wilson, Shrub Oak, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Dec. 6, 1988, Ser. No. 280,757

Int. Cl.[4] B01J *27/04;* C01B *17/20*

U.S. Cl. 502—215 42 Claims

1. A crystalline composition having a three-dimensional microporous framework structure of MA_2 units, where A is sulfur or selenium having an intracrystalline pore system and having the empirical formula expressed in molar ratios: $xR:MA_{2\pm0.2}:zH_2O$ where R represents at least one organic templating agent present in the intracrystalline pore system, x has a value greater than 0 to about 1.0, and z has a value of about 0 to about 4.0 and M is germanium, tin, or a combination thereof.

4,880,762

COLORING PHTHALIDE COMPOUNDS, METHOD OF PRODUCING THE COMPOUNDS AND RECORDING MATERIALS USING ANY OF THE COMPOUNDS AS COLORING COMPONENT

Kiyotaka Iiyama, Mishima, and Kunio Hayakawa, Gotemba, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

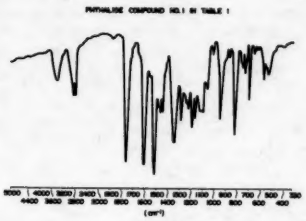
Filed Nov. 20, 1987, Ser. No. 123,350

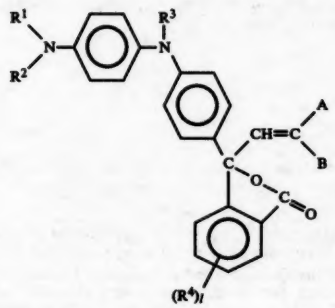
Claims priority, application Japan, Nov. 21, 1986, 61-278368

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

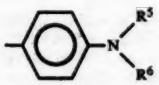
U.S. Cl. 503—220 6 Claims

1. A recording material, comprising a substrate and a coloring component thereon comprising a phthalide compound having the formula:





wherein R^1 and R^2 each represent a straight chain or a branched alkly group having 1 to 6 carbon atoms, a cycloalkyl group, or a benzyl group, or R^1 and R^2 in combination form a ring; R^3 represents an alkyl group having 1 to 4 carbon atoms; R^4 represents a dialkylamino group having 1 to 6 carbon atoms, a cyclic amino group or halogen; l is an integer of 0 to 4; A represents a group of the formula:



wherein R^5 and R^6 each represent a straight chain or a branched alkyl group having 1 to 8 carbon atoms, cycloalkyl group, or a benzyl group, or R^5 and R^6 in combination form a ring; and B is the same as A or represents a phenyl group which is unsubstituted or is substituted.

4,880,763

CATALYST FOR PRODUCTION OF HYDROCARBONS

Sigrid Eri, Trondheim, Norway; James G. Goodwin, Jr.; George Marcelin, both of Pittsburgh, Pa., and Trygve Riis, Oslo, Norway, assignors to Den norske stats oljeselskap a.s., Norway

Continuation-in-part of Ser. No. 113,095, Oct. 23, 1987, Pat. No. 4,801,573. This application Oct. 18, 1988, Ser. No. 259,232

Int. Cl.[4] B01J *21/04, 23/04, 23/36*

U.S. Cl. 502—302 15 Claims

1. A catalyst for converting synthesis gas to hydrocarbons comprising amounts of cobalt catalytically active in a Fischer-Tropsch synthesis, relatively lesser amounts of rhenium than the cobalt content and relatively lesser amounts of an alkali metal than the cobalt content of the catalyst, composited on an alumina support, wherein the alkali metal is selected from the group consisting of elements from Group IA of the periodic table.

4,880,764

DEHYDROGENATION CATALYST AND PROCESS

Tamotsu Imai, Mt. Prospect, and Hayim Abrevaya, Wilmette, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 221,977, Jul. 20, 1988, Pat. No. 4,827,072, which is a division of Ser. No. 131,882, Dec. 11, 1987, Pat. No. 4,786,625, which is a continuation-in-part of Ser. No. 18,541, Feb. 25, 1987, Pat. No. 4,716,143, which is a continuation-in-part of Ser. No. 871,356, Jun. 6, 1986, abandoned. This application Dec. 23, 1988, Ser. No. 289,137

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[4] B01J *21/04, 23/58, 23/62*

U.S. Cl. 502—326 11 Claims

1. A catalytic composite comprising platinum, a first catalytic modifier component selected from Group IA and IIA elements of the Periodic Table of the Elements or mixtures thereof, a second catalytic modifier component selected from the group iridium, osmium, or mixtures thereof, and a third catalytic modifier component selected from one or more elements of Group IVA of the Periodic Table of the Elements, all on a refractory oxide support having a nominal diameter (d) of from 50 to 10000 microns, the catalytic composite characterized in that the second catalytic modifier component is surface-impregnated upon the catalytic composite such that the average concentration of the surface-impregnated second catalytic modifier component on the outside 0.2 d micron layer of the catalyst is at least 2 times the average concentration of the second catalytic modifier component in the 0.4 d micron diameter center core of the catalyst, and wherein the first modifier metal component is uniformly impregnated through the refractory oxide support.

4,880,765

PROCESS FOR PRODUCING CARBON MOLECULAR SIEVES

Karl Knoblauch, Essen; Ferdinand Tarnow, Duisburg, and Heinrich Heimbach, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

PCT No. PCT/EP87/00268, § 371 Date Nov. 3, 1988, § 102(e) Date Nov. 3, 1988, PCT Pub. No. WO87/07249, PCT Pub. Date Dec. 3, 1987

PCT Filed May 22, 1987, Ser. No. 272,694

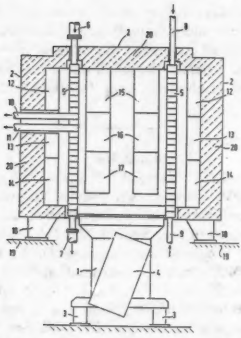
Claims priority, application Fed. Rep. of Germany, May 31, 1986, 3618426

Int. Cl.[4] C01B *31/10, 31/08;* B01J *20/20*

U.S. Cl. 502—432 2 Claims

1. Process for producing carbon molecular sieves for the separation of oxygen and nitrogen, wherein a carbonization product with a content of up to 5% by volume of volatile components is treated with carbon-splitting hydrocarbons which react in the carbon structure of the carbonization product with narrowing the already existing pores, *characterized in*

that the carbonization product is passed through a vibrating oven at 800° C. to 900° C. for 5 to 30 minutes, whereinto a stream of inert gas with a steam concentration of 20 to 95% by volume has been fed in counterflow to produce a slightly activated product and this slightly activated product is again



passed through the vibrating oven, at 750° C. to 850° C., whereinto a stream of inert gas with a benzene vapor concentration of 5 to 12% by volume has been fed in counterflow to produce a carbon molecular sieve having narrower pores than said carbonization product.

4,880,766

RECORD MATERIAL

Robert E. Miller; Steven L. Vervacke; Timothy J. Bahowick, and Kenneth D. Glanz, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 23, 1988, Ser. No. 171,983

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—212 **27 Claims**

1. A record member comprising a substrate and a color developer material comprising a homogeneous mixture of:

(a) a color developer containing at least about 3.4 weight percent phenolic group,

(b) divalent zinc, and

(c) an aromatic carboxylate component, wherein the aromatic carboxylic acid or mixture of acids corresponding to said aromatic carboxylate component possesses an octanol/water partition coefficient of about 2.9 or greater and said color developer material possesses a color-forming efficiency of about 95 or greater and a solvent resistance greater than about 30 percent.

4,880,767

RECORDING MATERIAL

Shigetoshi Hiraishi, Tokyo; Mitsuru Fuchigami; Masahiro Miyauchi, both of Takasago, and Kazuo Kabashima, Yokohama, all of Japan, assignors to Mitsubishi Paper Mills, Tokyo and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Filed Nov. 18, 1987, Ser. No. 122,191

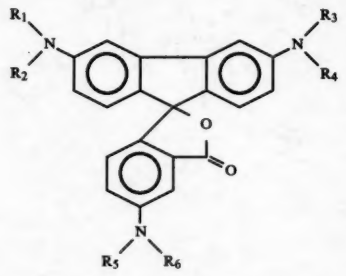
Claims priority, application Japan, Nov. 18, 1986, 61-273009

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—217 **9 Claims**

1. A recording material which comprises a color forming layer containing a color forming system comprising

(A) (a) a colorless or light-colored dye precursor represented by the formula:



(I)

wherein R_1 through R_6 are independently a lower alkyl group,

(b) a color developer which can form a color by reacting with the dye precursor and is a sulfur-containing phenolic derivative, and

(B) (c) an isocyanate compound having aromaticity, and

(d) an imino compound having at least one

group, said color forming layer being carried on a support.

4,880,768

SUBLIMATION TYPE THERMOSENSITIVE IMAGE TRANSFER RECORDING MEDIUM

Hidehiro Mochizuki, Shizuoka; Masanaga Imamura, Fujinomiya; Akira Suzuki, Mishima; Masaru Shimada, Shizuoka, and Hiroyuki Uemura, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,409

Claims priority, application Japan, Sep. 7, 1987, 62-224268; Nov. 6, 1987, 62-280434; Mar. 15, 1988, 63-062866; Apr. 15, 1988, 63-091290

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **26 Claims**

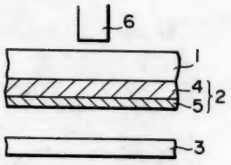
1. A sublimation type thermosensitive image transfer recording medium comprising:

a support;

a dye supplying layer formed on said support, comprising a sublimable dye and at least one binder agent in which said sublimable dye is dissolved or dispersed; and

an image transfer facilitating layer formed on said dye supplying layer, comprising said sublimable dye and at least one organic binder agent in which said sublimable dye is dissolved or dispersed, said dye supplying layer and said image transfer facilitating layer being constructed in such a manner that (1) the concentration of said sublimable dye in said dye supplying layer is made greater than that of

said sublimable dye in said image transfer facilitating layer or (2) the diffusion coefficient of said sublimable dye in



said dye supplying layer is greater than that of said sublimable dye in said image transfer facilitating layer.

4,880,769

TRANSFER OF CATINIC DYES IN THEIR DEPROTONATED, ELECTRICALLY NEUTRAL FORM

Johannes P. Dix, Neuhofen; Karl-Heinz Etzbach; Udo Mayer, both of Frankenthal, and Ruediger Sens, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

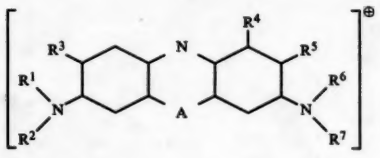
Filed Dec. 18, 1987, Ser. No. 134,979

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644369

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **4 Claims**

1. A process for transferring a dye from a substrate to an acceptor by sublimation or vaporization of the dye using a thermal printing head which comprises using a substrate on which there is situated a cationic dye and a binder, said cationic dye having a cyanine chromaphore and one or more N-H groups which are part of the cyanine chromaphore, in its electrically neutral form as the result of deprotonation at the N-H group, and transferring said deprotonated dye to a coated paper, said cationic dye having a cation of the formula



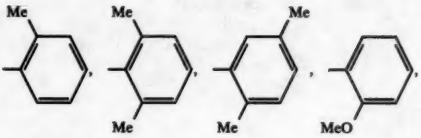
where

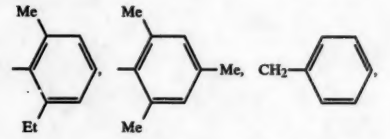
R^1 and R^2 are hydrogen, methyl or ethyl,

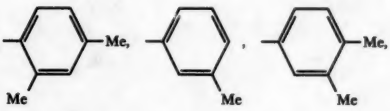
R^3 and R^5 are hydrogen, methyl or methoxy,

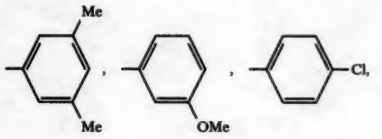
R^4 is hydrogen,

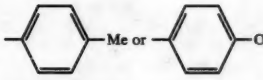
R^6 is hydrogen, methyl, ethyl



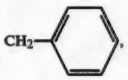








R^7 is hydrogen, methyl, ethyl or



and

A is oxygen.

4,880,770

METALORGANIC DEPOSITION PROCESS FOR PREPARING SUPERCONDUCTING OXIDE FILMS

Jose M. Mir, Webster; John A. Agostinelli, Rochester; David L. Peterson, Penfield; Gustavo R. Paz-Pujalt, Rochester; Brian J. Higberg, Pittsford, and Gopalan Rajeswaran, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 4, 1987, Ser. No. 46,593

Int. Cl.[4] B05D *3/02*

U.S. Cl. 505—1 **46 Claims**

9. A process of preparing an article comprised of a substrate and a crystalline electrically conductive rare earth alkaline earth copper oxide coating on the substrate exhibiting a T_c in excess of 30° K. comprising

choosing the substrate from the class consisting of strontium titanate, magnesia, and alumina,

applying to the substrate a coating of a solution consisting essentially of a volatilizable film forming solvent, metal-ligand compounds of each of rare earth and alkaline earth containing at least one thermally volatilizable organic ligand, and at least one copper-ligand compound containing a thermally volatilizable carboxylate ligand,

removing the solvent and organic ligands from the substrate

by heating in the presence of oxygen to form a coating of less than 1 μm in thickness, and

forming a crystalline conductive metal oxide coating on the substrate by heating to a temperature in the range of from 900° to 1100° C. followed by contact with air or an oxygen enriched atmosphere during cooling.

4,880,771

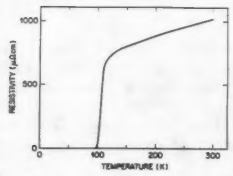
BISMUTH-LEAD-STRONTIUM-CALCIUM-CUPRATE SUPERCONDUCTORS

Robert J. Cava, Bridgewater, and Steven A. Sunshine, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 155,330, Feb. 12, 1988. This application Feb. 26, 1988, Ser. No. 160,799

Int. Cl.[4] C01F *11/02;* **C01G** *21/02, 29/00;* **H01L** *39/12*

U.S. Cl. 505—1 **2 Claims**



1. A superconductive element comprising an effective amount of material nominally of perovskite structure and of nominal composition $X_{2+x}M_{3-x}Cu_2O_{8\pm\delta}$, where X is Bi and Pb, M is Sr and Ca, x is equal to or greater than 0 and less than about 0.3, δ is greater than about 0 and less than about 0.5, the Pb/Bi ratio is between about 0.2 and about 0.5, the Sr/Ca ratio is between about 0.5 and about 2, and the element manifesting a transition temperature $T_c(R=o)$ of at least 77 K.

4,880,772

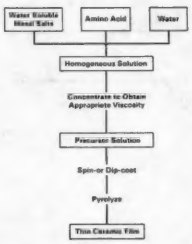
PREPARATION OF THIN CERAMIC FILMS VIA AN AQUEOUS SOLUTION ROUTE

Larry R. Pederson, Kennewick; Lawrence A. Chick, and Gregory J. Exarhos, both of Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Jun. 9, 1988, Ser. No. 204,643

Int. Cl.[4] B05D *3/02, 5/06, 5/12;* **C23C** *18/02*

U.S. Cl. 505—1 **7 Claims**



1. A method of forming oxide ceramic films, which comprises use of an aqueous solution of soluble metal salts and a low molecular weight amino acid, coating said solution onto a substrate, and pyrolyzing said film.

4,880,773

SUPERCONDUCTING MATERIAL AND A METHOD FOR PREPARING THE SAME

Hideo Itozaki; Saburo Tanaka; Nobuhiko Fujita; Shuji Yazu, and Tetsuji Jodai, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 25, 1988, Ser. No. 223,634

Claims priority, application Japan, Jul. 25, 1987, 62-185739; Jul. 26, 1987, 62-185710

Int. Cl.[4] C01F *11/02, 17/00;* **C01G** *3/02;* **H01L** *39/12*

U.S. Cl. 505—1 **1 Claim**

1. A superconducting material comprising a compound oxide represented by the formula:

$$(Ba, Ca)_x(\alpha, Dy)_{1-x}Tl_yCu_{1-y}O_{3-z}$$

where the atomic ratio of Ca to Ba is selected to be about 10%,

α represents Y or La,

the atomic ratio of Dy to α is selected to be about 30%,

x, y and z are numbers wherein x is selected to be about 0.66, y is selected to be about 0.11, and z is selected to be in the range $0 \leqq z \leqq 1$, and

the expression (Ba, Ca) and (α, Dy) mean that the respective elements position predetermined sites in a crystal in a predetermined proportion.

4,880,774

SUSTAINED RELEASE AROMATIC

Isao Joukou; Ayako Sekikawa; Hideo Sugi, and Kenji Tahara, all of Kanagawa, Japan, assignors to Kurita Water Industries, Ltd., Tokyo, Japan

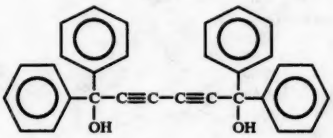
Filed Apr. 8, 1988, Ser. No. 179,085

Claims priority, application Japan, Apr. 14, 1987, 62-91771; Feb. 24, 1988, 63-41289

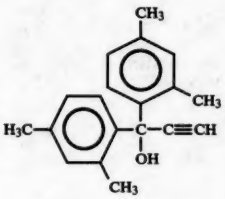
Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—2 2 Claims

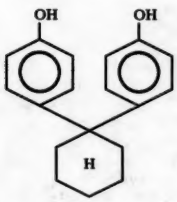
1. A sustained release aromatic comprising a clathrate compound composed of a perfume and a polyphenyl compound, said polyphenyl compound being at least one compound selected from the group consisting of the compounds of formulas (I) to (VIII):



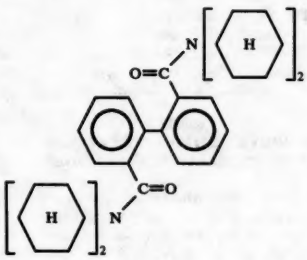
(I)



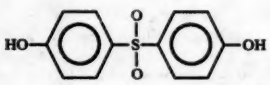
(II)



(III)



(IV)



(V)

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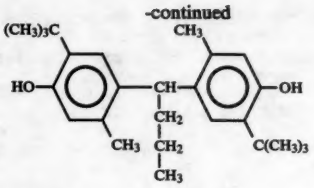
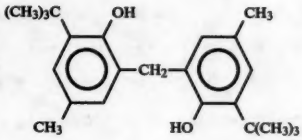
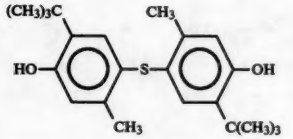


(VI)



(VII)



(VIII)

4,880,775

POLY-ALKYLATED BENZODIOXIN MUSK COMPOSITIONS

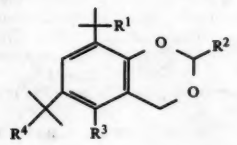
Philip A. Christenson, Midland Park; Brian Drake, Clifton, and Paul J. Riker, Lodi, all of N.J., assignors to BASF K&F Corporation, Parsippany, N.J.

Filed Feb. 1, 1987, Ser. No. 305,373

Int. Cl.[4] A01K *7/46*

U.S. Cl. 512—12 18 Claims

1. The compounds having the structure



wherein R^1 to R^4 are hydrogen or lower alkyl (C_1 to C_5).

8. A fragrance composition comprising an organoleptically effective amount of a compound of claim 1 and at least one other organoleptic agent.

4,880,776

PLASMIN A-CHAIN UROKINASE B-CHAIN HYBRID PROTEIN

Jeffery H. Robinson, and Ian Dodd, both of Epsom, England, assignors to Beecham Group p.l.c., United Kingdom

Continuation-in-part of Ser. No. 41,710, Apr. 23, 1987, abandoned, and a continuation-in-part of Ser. No. 684,593, Dec. 21, 1984, Pat. No. 4,752,581. This application Mar. 25, 1988, Ser. No. 173,430

Claims priority, application United Kingdom, Dec. 24, 1983, 8334498; Apr. 23, 1986, 8609948

Int. Cl.[4] C12N *9/68, 9/72;* A61K *37/54, 37/547*

U.S. Cl. 514—2 9 Claims

1. A hybrid protein which comprises plasmin A-chain linked to urokinase B-chain, the catalytic site of which is blocked by a removable blocking group.

4,880,777

SYNTHETIC PEPTIDES HAVING GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Concord, Mass., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1987, Ser. No. 91,919
Int. Cl.[4] A61K *37/43*; C07K *7/10*
U.S. Cl. 514—12 **12 Claims**

1. A polypeptide selected from the group consisting of:

Compound 1
Tyr—Ala—Asp—Ala—Ile—Phe—Thr—Asn—Cys—Tyr—Arg—
Lys—Val—Leu—Cys—Gln—Leu—Ser—Ala—Arg—Lys—Leu—
Leu—Gln—Asp—Ile—Nle—Ser—Arg—NH_2 (free dithiol),

and organic or inorganic addition salts thereof; and

Compound 2
Tyr—Ala—Asp—Ala—Ile—Phe—Thr—Asn—Cys—Tyr—Arg—
Lys—Val—Leu—Cys—Gln—Leu—Ser—Ala—Arg—Lys—Leu—
Leu—Gln—Asp—Ile—Nle—Ser—Arg—NH_2 (cyclic disulfide),

4,880,778

COMBINATIONS HAVING SYNERGISTIC GROWTH HORMONE RELEASING ACTIVITY AND METHODS FOR USE THEREOF

Cyril Y. Bowers, New Orleans, La.; Frank A. Momany, Concord, Mass.; Ching H. Chang; Wayne Cody, both of Kingsport, Tenn.; John C. Hubbs, Gray, and Charles H. Foster, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 861,968, May 12, 1986, abandoned. This application Apr. 10, 1987, Ser. No. 37,275
Int. Cl.[4] H61K *37/43*
U.S. Cl. 514—12 **32 Claims**

1. A composition effective to cause the release and elevation of the level of growth hormone in the blood of an animal, the composition comprising an effective amount of polypeptides selected from at least two different groups of Group 1 polypeptides, Group 2 polypeptides or Group 3 polypeptides. In a ratio such that such composition is effective to cause the synergistic release and elevation of growth hormone in the blood of such animal;

wherein Group 1 polypeptides are selected from any of the mutually occurring growth hormone releasing hormones and functional equivalents thereof, wherein said polypeptides act at the growth hormone releasing hormone receptor of mammals and other vertebrates, and crustaceans;

Group 2 polypeptides are selected from any of the polypeptides having the structure:

Ala-His-DTrp-Ala-Trp-DPhe-Lys-Gly-Tyr-NH_2;
Ala-His-(formyl)DTrp-Ala-Trp-DPhe-Lys-NH_2 (DTrp is formylated at the indole nitrogen);
Ala-His-DTrp-Ser-Trp-DPhe-Lys-NH_2;
Cys-Ala-His-DTrp-Ala-Trp-DPhe-Lys-Cys-NH_2 (cyclic disulfide);
Cys-Ala-His-DTrp-Ala-Trp-DPhe-Lys-Cys-NH_2 (free dithiol);
DOPA-Ala-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
His-DTrp-Ala-Trp-DPhe-Lys-Ala-Tyr-NH_2;
Lys-Ala-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
Lys-His-DTrp-Ala-Trp-DPhe-Asp-NH_2;
Phe-Ala-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
Tyr-Ala-Gly-Thr-Ala-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
Tyr-Ala-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
Tyr-DAla-Phe-Gly-Ala-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
Tyr-DAla-Gly-Phe-Ala-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
Ala-His-XTrp*-Ala-Trp-DPhe-Lys-NH_2 (*XTrp is selected from the group consisting of all N-monomethylated Trp isomers, i.e., (N^{α}Me)Trp, (N^{α}Me)DTrp, (indole NMe)Trp and (indole NMe)DTrp);
Z-His-DTrp-Ala-Trp-DPhe-Lys-NH_2;
wherein Z is selected from the group consisting of all naturally occurring L-amino acids, Met(O), DOPA and Abu;
and organic or inorganic addition salts of any of said polypeptides of Group 2; and

Group 3 polypeptides are selected from any of the polypeptides having the structure:

Tyr-DArg-Phe-NH_2;
Tyr-DAla-Phe-NH_2;
Tyr-DArg(NO_2)-Phe-NH_2;
Tyr-DMet(O)-Phe-NH_2;
Tyr-DAla-Phe-Gly-NH_2;
Tyr-DArg-Phe-Gly-NH_2;
Tyr-DThr-Phe-Gly-NH_2;
Phe-DArg-Phe-Gly-NH_2;
Tyr-DArg-Phe-Sar;
Tyr-DAla-Gly-Phe-NH_2;
Tyr-DArg-Gly-Trp-NH_2;
Tyr-DArg(NO_2)-Phe-Gly-NH_2;
Tyr-DMet(O)-Phe-Gly-NH_2;
(NMe)Tyr-DArg-Phe-Sar-NH_2;
Tyr-DArg-Phe-Gly-ol;
Tyr-DArg-Gly-(NMe)Phe-NH_2;
Try-DArg-Phe-Sar-ol
Tyr-DAla-Phe-Sar-ol
Tyr-DAla-Phe-Gly-Tyr-NH_2;
Gly-Tyr-DArg-Phe-Gly-NH_2;
Tyr-DThr-Gly-Phe-Thz-NH_2;
Gly-Tyr-DAla-Phe-Gly-NH_2;
Tyr-DAla-Phe-Gly-ol;
Tyr-DAla-Gly-(NMe)Phe-Gly-ol;
Tyr-DArg-Phe-Sar-NH_2;
Tyr-DAla-Phe-Sar-NH_2;
Tyr-DAla-Phe-Sar;
Tyr-DAla-Gly-(NMe)Phe-NH_2;
Sar-Tyr-DArg-Phe-Sar-NH_2;
Tyr-DCys-Phe-Gly-DCys-NH_2 (cyclic disulfide);
Tyr-DCys-Phe-Gly-DCys-NH_2 (free dithiol);
Tyr-DCys-Gly-Phe-DCys-NH_2 (cyclic disulfide);
Tyr-DCys-Gly-Phe-DCys-NH_2 (free dithiol);
Tyr-DAla-Phe-Gly-Tyr-Pro-Ser-NH_2;
Tyr-DAla-Phe-Sar-Tyr-Pro-Ser-NH_2;
Tyr-DAla-Phe-Sar-Phe-Pro-Ser-NH_2;
Tyr-DAla-Phe-Gly-Tyr-Hyp-Ser-NH_2;
Tyr-DAla-Phe-Sar-Tyr-Hyp-Ser-NH_2;
Tyr-DAla-Phe-Sar-Phe-Hyp-Ser-NH_2;
Tyr-DArg-Phe-Gly-Tyr-Hyp-Ser-NH_2;
Tyr-DArg-Phe-Sar-Tyr-Pro-Ser-NH_2;
Tyr-DArg-Phe-Sar-Tyr-Hyp-Ser-NH_2;
Tyr-DArg-Phe-Gly-Tyr-Pro-Ser-NH_2; and organic or inorganic addition salts of any of said polypeptides of Group 3.

4,880,779

METHOD OF PREVENTION OR TREATMENT OF AIDS BY INHIBITION OF HUMAN IMMUNODEFICIENCY VIRUS

William R. Gallaher, New Orleans, La., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Jul. 31, 1987, Ser. No. 80,529
Int. Cl.[4] A61K *37/02, 39/21*
U.S. Cl. 514—15 **13 Claims**

1. A method for inhibition of a retrovirus which comprises administering to a host a composition comprising an inhibitory effective amount of a peptide of 3 to about 11 amino acids containing the amino acid sequence Phe-X-Gly, wherein X is any amino acid.

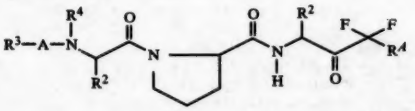
4,880,780

SELECTED DIFLUORO DERIVATIVES

Diane A. Trainor, Glen Mills, Pa., and Mark M. Stein, Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 872,106, Jun. 6, 1986, abandoned. This application Jun. 4, 1987, Ser. No. 58,079
Claims priority, application United Kingdom, Jun. 7, 1985, 8514436; Jun. 7, 1985, 8514438; Jun. 7, 1985, 8514440
Int. Cl.[4] A61K *37/43*; C07K *5/08*
U.S. Cl. 514—18 9 Claims

1. A compound of formula Ic:



Ic

wherein

R^1 is an alkyl group containing from 1 to 5 carbons;

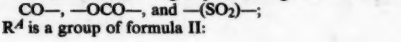
R^2 is an alkyl group containing from 1 to 10 carbons;

R^3 is an aryl group containing 6, 10 or 12 carbons substituted by acylsulfonamido containing an aryl of 6, 10 or 12 carbons which may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;

R^4 is selected from the group consisting of hydrogen and methyl;

A is selected from the group consisting of —CO—, —NH-CO—, —OCO—, and —(SO_2)—;

R^A is a group of formula II:



II

wherein X is NR^C, R^C is hydrogen or CH_3; and

R^B is selected from the group consisting of (6 or 10C)aryl(-1–6C)alkyl, and pharmaceutically acceptable salts thereof.

4,880,781

RENIN INHIBITORY PEPTIDES CONTAINING AN N-ALKYL-HISTIDINE MOIETY

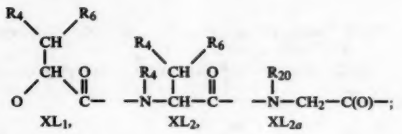
Jackson B. Hester, Jr., Galesburg; Suvit Thaisrivongs, Portage; Tomi K. Sawyer; Ruth Σ. TenBrink, both of Kalamazoo, all of Mich.; Hossain H. Saneii, Louisville, Ky.; Heinrich J. Schostarez, and Donald T. Pals, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 753,198, Jul. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 693,320, Jan. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 663,028, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 663,024, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 663,027, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 663,023, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 663,026, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 663,093, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 638,027, Aug. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 638,041, Aug. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 638,025, Aug. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 38,023, Aug. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 638,024, Aug. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 638,026, Aug. 6, 1984, abandoned. This application Jan. 20, 1988, Ser. No. 147,073
Int. Cl.[4] A61K *37/43*; C07K *7/06, 5/08, 5/10, 5/06*
U.S. Cl. 514—18 29 Claims

1. A renin inhibitory peptide of the formula X-A_6-B_7-C-$_8$-D_9-E_{10}-F_{11}-G_{12}-H_{13}-I_{14}-Z,

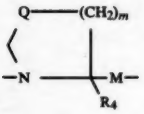
wherein X is

(a) hydrogen, (b) C_1–C_5alkyl (c) R_5—O—CH_2—C(O)—, (d) R_5—CH_2—O—C(O)—, (e) R_5—O—C(O)—, (f) R_5—$(CH_2)_n$—C(O)—, (g) $R_4N(R_4)$—$(CH_2)_n$—C(O), (h) R_5—SO_2—$(CH_2)_q$—C(O)—, or (i) R_5—SO_2—$(CH_2)_q$—O—C(O)—; wherein A_6 is absent or a divalent moiety of the formula XL_1, XL_2, or XL_{2a}



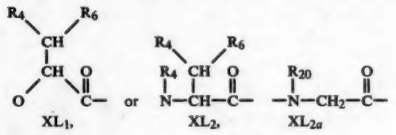
XL_1, XL_2, XL_{2a};

wherein B_7 is absent or a divalent moiety of the formula XL_b



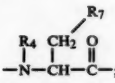
XL_b

wherein C_8 is absent or a divalent moiety of the formula XL_1, XL_2 or XL_{2a},



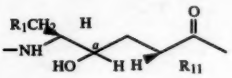
XL_1, or XL_2, XL_{2a}

wherein D_9 is a divalent moiety of the formula XL_3,

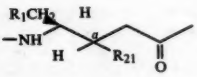


XL_3;

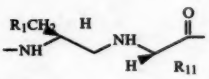
wherein E_{10}–F_{11} is a divalent moiety of the formula XL_6, XL_{6a}, XL_{6b}, XL_{6c}, XL_{6d}, or XL_{6e},



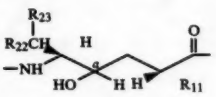
XL_6



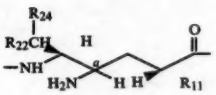
XL_{6a}



XL_{6b}

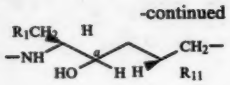


XL_{6c}



XL_{6d}

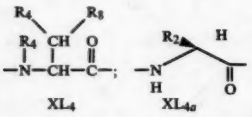
-continued



XL_{6c}

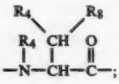
wherein * indicates an asymmetric center which is either in the R or S configuration;

wherein G_{12} is absent or a divalent moiety of the formula XL_4 or XL_{4a}



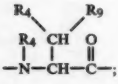
XL_4 XL_{4a}

wherein H_{13} is absent or a divalent moiety of the formula XL_4



XL_4

wherein I_{14} is absent or a divalent moiety of the formula XL_5



XL_5

wherein Z is
(a) —O—R_{10}, (b) —N(R_4)R_{14}, or (c) C_4–C_8cyclic amino;
wherein R is
(a) isopropyl, (b) isobutyl, (c) phenylmethyl, or
(d) C_3–C_7cycloalkyl;
wherein R_1 is
(a) hydrogen,
(b) C_1–C_5alkyl,
(c) aryl,
(d) C_3–C_7cycloalkyl,
(e) —Het, (f) C_1–C_3alkoxy, or (g) C_1–C_3alkylthio;
wherein R_2 is
(a) hydrogen, or (b) —CH(R_3)R_4;
wherein R_3 is
(a) hydrogen, (b) hydroxy, (c) C_1–C_5alkyl, (d) C_3–C_7cycloalkyl, (e) aryl, (f) —Het, (g) C_1–C_3alkoxy, or (h) C_1–C_3alkylthio;
wherein R_4 at each occurrence is the same or different and is
(a) hydrogen, or (b) C_1–C_5alkyl; wherein R_4 in D_9 is C_1–C_5 alkyl; wherein R_5 is (a) C_1–C_6alkyl, (b) C_3–C_7cycloalkyl, (c) aryl, (d) —Het, or (e) 5-oxo-2-pyrrolidinyl;
wherein R_6 is
(a) hydrogen, (b) C_1–C_5alkyl, (c) —$(CH_2)_p$—aryl, (d) —$(CH_2)_p$—Het, (e) C_3–C_7cycloalkyl, or (f) 1- or 2-adamantyl;
wherein R_7 is (a) hydrogen, (b) C_1–C_5alkyl, (c) hydroxy, (d) amino C_1–C_4alkyl—,
(e) guanidinyl C_1–C_3alkyl-,
(f) aryl, (g) —Het, (h) methylthio, (i) C_3–C_7cycloalkyl, or (j) amino;
wherein R_7 in D_9 is 1H-imidazol-4-yl;
wherein R_8 is
(a) hydrogen, (b) C_1–C_5alkyl, (c) hydroxy, (d) aryl, (e) —Het, (f) guanidinyl C_1–C_3alkyl-, or (g) C_3–C_7cycloalkyl;
wherein R_9 is
(a) hydrogen, (b) hydroxy, (c) amino C_1–C_4alkyl-, or (d) guanidinyl C_1–C_3alkyl-;
wherein R_{10} is
(a) hydrogen, (b) C_1–C_5alkyl, (c) —$(CH_2)_n$$R_{16}$, (d) —$(CH_2)_n$$R_{17}$, (e) C_3–C_7cycloalkyl, (f) a pharmaceutically acceptable cation, (g) —(CHR_{25})—CH_2—R_{15}, or (h) —CH_2—(CHR_{12})—R_{15};
wherein R_{11} is —R or —R_2;
wherein R_{12} is —$(CH_2)_n$—R_{13};
wherein R_{13} is
(a) aryl, (b) amino, (c) mono-, di or tri-C_1–C_3alkylamino, (d) —Het, (e) C_1–C_5alkyl (f) C_3–C_7cycloalkyl, (g) C_1–C_5alkenyl, (h) C_3–C_7cycloalkenyl, (i) hydroxy, (j) C_1–C_3alkoxy, (k) C_1–C_3alkanoyloxy, (l) mercapto, (m) C_1–C_3alkylthio, (n) —COOH, (o) —CO—O—C_1–C_6alkyl, (p) —CO—O—CH_2—(C_1–C_3alkyl)—N(C_1–C_3alkyl)$_2$, (q) —CO—$NR_{22}R_{26}$; (r) C_4–C_7cyclic amino, (s) C_4–C_7cycloalkylamino, (t) guanidyl, (u) cyano, (v) N-cyanoguanidyl, (w) cyanoamino, (x) (hydroxy C_2–C_4alkyl)amino, or (y) di-(hydroxyC_2–C_4alkyl)amino;
wherein R_{14} is
(a) hydrogen, (b) C_1–C_{10}alkyl, (c) —$(CH_2)_n$—R_{18}, (d) —$(CH_2)_n$—R_{19}, (e) —(CHR_{25})—CH_2—R_{15}, (f) —CH_2—(CHR_{12})—R_{15}, (g) (hydroxy C_1–C_8alkyl), or (h) (C_1–C_3alkoxy)C_1–C_8alkyl;
wherein R_{15} is
(a) hydroxy, (b) C_3–C_7cycloalkyl, (c) aryl, (d) amino, (e) mono-, di-, or tri- C_1–C_3alkylamino, (f) mono- or di-[hydroxy C_2–C_4alkyl]amino, (g) —Het, (h) C_1–C_3alkoxy-, (i) C_1–C_3alkanoyloxy-, (j) mercapto, (k) C_1–C_3alkylthio-, (l) C_1–C_5alkyl, (m) C_4–C_7cyclic amino, (n) C_4–C_7cycloalkylamino, (o) C_1–C_5alkenyloxy, (p) C_3–C_7cycloalkenyl;
wherein R_{16} is
(a) aryl, (b) amino, (c) mono- or di- C_1–C_3alkylamino, (d) hydroxy, (e) C_3–C_7cycloalkyl, (f) C_4–C_7cyclic amino, or (g) C_1–C_3alkanoyloxy;
wherein R_{17} is
(a) —Het, (b) C_1–C_5alkenyl, (c) C_3–C_7cycloalkenyl, (d) C_1–C_3alkoxy, (e) mercapto, (f) C_1–C_3alkylthio, (g) —COOH, (h) —CO—O—C_1–C_6alkyl, (i) —CO—O—CH_2—(C_1–C_3alkyl)—N(C_1–C_3alkyl)$_2$, (j) —CO—$NR_{22}R_{26}$, (k) tri-C_1–C_3alkylamino, (l) guanidyl, (m) cyano, (n) N-cyanoguanidyl, (o) (hydroxy C_2–C_4alkyl)amino, (p) di-(hydroxy C_2–C_4alkyl)amino, or (q) cyanoamino; wherein R_{18} is (a) amino, (b) mono-, or di- C_1–C_3alkylamino, (c) C_4–C_7cyclic amino, or (d) C_4–C_7cycloalkylamino;
wherein R_{19} is
(a) aryl, (b) —Het, (c) tri-C_1–C_3alkylamino, (d) C_3–C_7cycloalkyl, (e) C_1–C_5alkenyl, (f) C_3–C_7cycloalkenyl, (g) hydroxy,
(h) C_1–C_3alkoxy, (i) C_1–C_3alkanoyloxy, (j) mercapto, (k) C_1–C_3alkylthio, (l) —COOH, (m) —CO—O—C_1–C_6alkyl, (n) —CO—O—CH_2—(C_1–C_3alkyl)—N(C_1–C_3alkyl)$_2$, (o) —CO—$NR_{22}R_{26}$, (p) guanidyl, (q) cyano, (r) N-cyanoguanidyl, (s) cyanoamino, (t) (hydroxy C_2–C_4alkyl)amino, (u) di-(hydroxy C_2–C_4alkyl)amino; or (v) —SO_3H; wherein R_{20} is (a) hydrogen, (b) C_1–C_5alkyl, or (c) aryl-C_1–C_5alkyl;
wherein R_{21} is
(a) —NH_2, or (b) —OH;
wherein R_{22} is
(a) hydrogen, or (b) C_1–C_3alkyl;
wherein R_{23} is
(a) —$(CH_2)_n$—OH, (b) —$(CH_2)_n$—NH_2, (c) aryl, or (d) C_1–C_3alkyl;
wherein R_{24} is
(a) —R_1, (b) —$(CH_2)_n$—OH, or (c) —$(CH_2)_n$—NH_2;
wherein R_{25} is —$(CH_2)_n$—R_{13};
wherein R_{26} is
(a) hydrogen, (b) C_1–C_3alkyl, or (c) phenyl-C_1–C_3alkyl;
wherein m is one or two;
wherein for each occurrence n is independently an integer of zero to five, inclusive;
wherein p is zero to 2 inclusive;

wherein q is 1 to 5, inclusive;
wherein Q is
(a) —CH_2—, (b) —CH(OH)—, (c) —O—, or (d) —S—; and
wherein M is
(a) —CO—, or (b) —CH_2—;
wherein aryl is phenyl or naphthyl substituted by zero to 3 of the following:
(a) C_1–C_3alkyl, (b) hydroxy, (c) C_1–C_3alkoxy, (d) halo, (e) amino, (f) mono- or di-C_1–C_3alkylamino, (g) —CHO, (h) —COOH, (i) $COOR_{26}$, (j) $COHR_{26}$, (k) nitro, (l) mercapto, (m) C_1–C_3alkylthio, (n) C_1–C_3alkylsulfinyl, (o) C_1–C_3alkylsulfonyl, (p) C_1–C_3alkylsulfonyl—$N(R_4)$— (q) SO_3H, (r) SO_2NH_2, (s) —CN, or
(t) —CN_2NH_2;
wherein —Het is a 5- or 6-membered saturated or unsaturated ring containing from one to three heteroatoms selected from the group consisting of nitrogen, oxygen, and sulfur; and including any bicyclic group in which any of the above heterocyclic rings is fused to a benzene ring, which heterocyclic moiety is substituted with zero to 3 of the following:
(i) C_1–C_6alkyl,
(ii) hydroxy,
(iii) trifluoromethyl,
(iv) C_1–C_4alkoxy,
(v) halo,
(vi) aryl,
(vii) aryl C_1–C_4alkyl-,
(viii) amino, and
(ix) mono- or di-C_1–C_4alkylamino; with the overall provisos that
(1) E_{10}–F_{11} is XL_{6a}, XL_{6b}, XL_{6c}, XL_{6d}, or XL_{6e} only when at least one of the following occurs:
(i) A_6 is present and
(A) A_6 is XL_1 or
(B) A_6 is XL_2 wherein R_6 is Het which is N^{in}-formyl-Trp,
(ii) B_7 is present and R_4 of B_7 is other than hydrogen,
(iii) C_8 is present and is XL_1,
(iv) D_9 is N_α-methyl-histidine,
(v) B_7 and C_8 both are present and B_7 is XL_b wherein M is —CH_2— and C_8 is XL_1; or
(vi) X is R_5—SO_2—$(CH_2)_q$—C(O)— or R_5—SO_2—$C(CH_2)_q$—OC(O)—;
(2) $E_{10}F_{11}$ is XL_{6e} only when G_{12}, H_{13} and I_{14} are absent;
(3) $B_7C_8D_9$ is Pro-Phe-His, $E_{10}F_{11}$ is XL_6, R_1 is isopropyl, or isobutyl; and R_{11} is isopropyl, isobutyl, or benzyl, only when one of the following occurs:
(a) only 1 of G_{12},H_{13}, and I_{14} is present; (b) G_{12} is other than D or L val or D or L Ile; (c) H_{13} is other than D or L Tyr, D or L Phe, or D or L His; or (d) A_6 is FTrp or XL_1;
(4) R_{16} or R_{17} is an amino-containing substituent, hydroxy, mercapto, or —Het bonded through the hetero atom only when n for that substituent is an integer from two to five, inclusive;
(5) R_{18} or R_{19} is hydroxy, mercapto, or amino, or a monosubstituted nitrogen containing group bonded through the nitrogen only when n is not one;
(6) A_6, B_7, C_8, H_{13} and I_{14} are all absent, D_9 and G_{12} are both present, and —NR_4—of D_9 is —NH— and Z is —OR_{10} and R_{10} is hydrogen, C_1–C_5alkyl, or —$(CH_2)_m$—R_{16} or Z is —$N(R_4)R_{14}$ and R_{14} is hydrogen, C_1–C_{10}alkyl or —$(CH_2)_n$—R_{18}, or Z is C_4–C_8cyclic amino, only when R_5—$(CH_2)_n$— is other than C_1–C_8alkyl, C_5–C_7cycloalkyl or aryl;
(7) A_6, B_7, C_8, D_9, H_{13}, I_{14} are all absent and G_{12} is present only when Z is —OR_{10} and R_{10} is —$(CH_2)_n$—R_{17}, —(CHR_{25})—CH_2R_{15} or —CH_2— (CHR_{12})—R_{15} or when Z is —$N(R_4)R_{14}$ and R_{14} is —$(CH_2)_n$—R_{19}, —(CHR_{25})—CH_2R_{15}, or —CH_2—(CHR_{12})—R_{15};
(8) R_{12} is —$(CH_2)_n$—R_{13} and n is zero and both R_{13} and R_{15} are oxygen-, nitrogen-, or sulfur-containing substituents bonded through the hetero atom, only when the hetero atom is not also bonded to hydrogen;
(9) when R_{12} is —$(CH_2)_n$—R_{13} and n is zero, then R_{13} and R_{15} cannot both be —COOH;
(10) R_{25} is —$(CH_2)_n$—R_{13} and n is zero only when R_{13} is other than a primary or secondary nitrogen-containing group hydroxy or mercapto group or when R_4 of —$N(R_4)R_{14}$ is other than hydrogen;
(11) Z is C_4–C_8cyclic amino, only when at least one of G_{12}, H_{13}, and I_{14} is present;
(12) R_{17} or R_{19} is —Het, only when —Het is other than cyclic amino;
(13) R_{17} or R_{19} is —COOH only when n for that moiety is other than zero; and
(14) at least one of A_6, B_7, C_8, D_9, G_{12}, H_{13} or I_{14} must be present;
or a carboxy-, amino-, or other reactive group-protected form
or a pharmaceutically acceptable acid addition salt thereof.

4,880,782

METHOD OF TREATING VIRAL INFECTIONS IN HUMANS AND COMPOSITIONS THEREFOR

Fritz Eckstein; Gerhard Hunsmann, and Heinz Hartmann, all of Göttingen, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V. and Deutsches Primatenzentrum GmbH, both of Goettingen, Fed. Rep. of Germany

Filed Apr. 22, 1987, Ser. No. 41,147
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639780; Mar. 18, 1987, 3708849
Int. Cl.[4] A61K *31/70;* **C07H** *19/07*
U.S. Cl. 514—45 **12 Claims**

1. Composition useful in treating an infection of human immunodeficiency virus comprising an anti human immunodeficiency virus effective amount of 3'-azido-2',3'-dideoxyinosine.

4,880,783

USE OF ADENOSINE, HYPOXANTHINE AND RIBOSE-CONTAINING SOLUTION FOR IMPROVED PROTECTION OF THE HEART DURING SURGERY

Robert M. Mentzer, Jr.; Stephen W. Ely; Robert D. Lasley, and Robert M. Berne, all of Charlottesville, Va., assignors to University of Virginia Alumnia Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 915,557, Oct. 6, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 252,027
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—46 **16 Claims**

1. A heart perfusate for reducing ischemic damage to a heart isolated from a normal blood supply comprising a cardioplegic solution having at least one purine nucleoside additive.

12. An improved method for enhancing ability of a myocardium to tolerate ischemia comprising perfusing a preischemic heart with a cardioplegic solution containing at least one purine nucleoside during either cardiovascular surgery or harvesting for cardiac transplantation, wherein the cardioplegic solution reduces the rate of ATP degradation during ischemia.

4,880,784

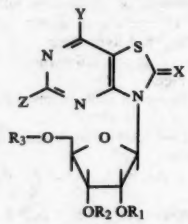
ANTIVIRAL METHODS UTILIZING RIBOFURANOSYLTHIAZOLO[4,5-D]PYRIMDINE DERIVATIVES

Roland K. Robins, Irvine, and Howard B. Cottam, Fallbrook, both of Calif., assignors to Brigham Young University, Provo, Utah

Filed Dec. 21, 1987, Ser. No. 136,020
Int. Cl.[4] A61K *31/665, 31/67*
U.S. Cl. 514—48 **17 Claims**

10. A method of treating rhabdovirus, picornavirus, coronavirus, togavirus, bunyavirus, flavivirus, herpesvirus and cytomegalovirus in an afflicted host, said method consisting of:

administering to said host a therapeutic effective amount of a compound of the structure:



wherein R_1 and R_2 individually are H or C_1–C_{18} acyl and R_3 is H, C_1–C_{18} acyl or

or R_1 is H and together R_2 and R_3 are

and X is =O or =S, Y is —OH, —SH, and Z is H, —NH_2, or a pharmaceutically acceptable salt thereof.

4,880,785

TOPICAL PROCESS FOR TREATING HERPES INFECTIONS USING 5-ISOPROPYL-2'-β-DEOXYURIDINE AS THE ACTIVE AGENT

Anna Szabolcs née Borbás; László Ötvös; János Sági; Helga Tudös née Feuer; Attila Szemző; Zsuzsa Veres; István Szinai; Miklós Vajda, all of Budapest; István Csernus, Debrecen; Katalin Marossy, Debrecen; Sándor Jancsó, Debrecen; Éva Medgyesi née Lukács, Debrecen, and György Bacsa, Debrecen, all of Hungary, assignors to MTA Kozponti Kemiai Kutato Intezete and BIOGAL Gyogyszergyar, Debrecen, Hungary

Filed Jun. 10, 1988, Ser. No. 204,724

Claims priority, application Hungary, Aug. 7, 1987, 3596/87

Int. Cl.[4] A61K *31/70;* **C07H** *19/073*

U.S. Cl. 514—50 **1 Claim**

1. The process for treating a herpes infection by the topical application of a pharmaceutical composition comprising 0.02–5% by mass of 5-isopropyl-2'-B-deoxyuridine admixed with carriers, diluents and/or other additives conventionally used in the production of pharmaceutical compositions for external uses.

4,880,786

ADDITIVE SOLUTION FOR BLOOD PRESERVATION AND ACTIVATION

Shigeru Sasakawa, and Masayuki Shiba, both of Tokyo, Japan, assignors to Ube Industries, Ltd., Ube; Showa Denko K.K. and The Japanese Red Cross Society, both of Tokyo, all of, Japan

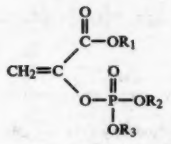
Filed Jan. 11, 1988, Ser. No. 142,786

Claims priority, application Japan, Jan. 14, 1987, 62-5080

Int. Cl.[4] A01N *1/02;* **A61K** *35/14*

U.S. Cl. 514—53 **11 Claims**

1. An additive solution for blood preservation and activation, comprising a phosphoenolpyruvic acid represented by the following formula (I):



(I)

wherein R_1 represents a hydrogen atom or an alkyl group having 1 to 12 carbon atoms, R_2 and R_3 represent a hydrogen atom, an alkali metal or an alkyl group having 1 to 12 carbon atoms, respectively,

an L-ascorbic acid-phosphate or its pharmaceutically acceptable salt, a saccharide, adenine and a pharmaceutically acceptable organic buffer.

4,880,787

CRACKING CATALYST

Robert G. Bundens, Mullica Hill, and Joseph A. Herbst, Turnersville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 916,258, Oct. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 897,000, Aug. 15, 1986, abandoned. This application Jan. 6, 1988, Ser. No. 140,872

Int. Cl.[4] B01J *29/08, 29/10*

U.S. Cl. 502—65 **36 Claims**

1. A catalyst composition comprising 1 to 60 weight percent framework dealuminated Y zeolite, based on the total weight of the composition;

40 to 99 weight percent of a matrix, based on the total weight of said composition;

0.01 to 15 weight percent alumina incorporated into said catalyst composition via ion exchange based on the total weight of said composition;

0.01 to 10 weight percent rare earth, expressed as the oxides of same, based on the total weight of said composition, dispersed, exchanged, impregnated or deposited in a composite of said zeolite and said matrix.

4,880,788

METHOD FOR PREVENTING AND TREATING THROMBOSIS

Joel L. Moake; Martin D. Phillips; Larry V. McIntire, and Jesse D. Hellums, all of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Oct. 30, 1987, Ser. No. 115,236

Int. Cl.[4] C07C *105/00, 107/00*

U.S. Cl. 514—150 **13 Claims**

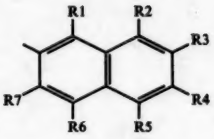
1. A method for treating a condition in an individual comprising administering a compound in an amount effective to prevent aggregation of blood platelets to an individual in need of said treatment wherein said condition is selected from the group consisting of arter' ' thrombosis and venous thromboembolism and wherein said compound is selected from the group having the formulas.

$X_1—N=N—Y_1—Q—Y_2—N=N—X_2$and

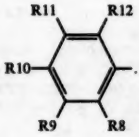
and salts thereof

wherein

X_1 and X_2 are



Y_1 and Y_2 are



Z_1, Z_2 and Z_3 are benzyl groups substituted in one or more positions with hydrogen groups, carboxyl groups or hydroxyl groups,

Q is a bond between the adjacent aryl or substituted aryl groups or a ureylene group or an alkylene or substituted alkylene group, and

R_1–R_7 is selected from the group consisting of hydrogen, a hydroxyl group, an amino group, a sulfate group, a phosphate group, a nitrate group, a nitrite group, a carboxyl group, an ester group, an ether group, an alkyl group, and salts of the aforementioned acidic substituents; and

R_8–R_{12} is selected from the group consisting of hydrogen, a lower alkyl group, an alkyl ether group and a lower alkanoyl oxy group, and salts thereof.

4,880,789

2'-SUBSTITUTED-4-DEOXY-THIAZOLO(5,4-C)-RIFAMYCIN SV DERIVATIVES

Bruno Cavalleri, Milan; Marco Turconi, Voghera, and Giovanni Tamborini, Pogliano Milanese, all of Italy, assignors to Gruppo Lepetit S.P.A., Gerenzano, Italy

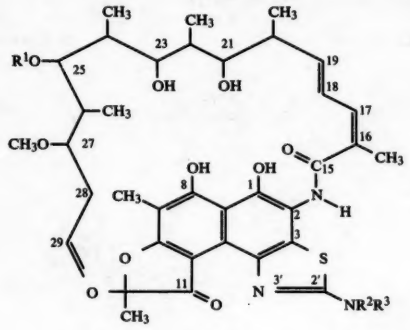
Continuation of Ser. No. 945,704, Dec. 23, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 238,985

Claims priority, application United Kingdom, Dec. 30, 1985, 8531887

Int. Cl.[4] C07D *513/08;* A61K *31/425*

U.S. Cl. 514—183 **19 Claims**

1. A compound of the formula:



I

wherein R^1 represents hydrogen or acetyl, R^2 and R^3 each independently represent (C_1–C_4)alkyl or R^2 and R^3 taken together with the adjacent nitrogen atom represent a 4–7 membered saturated heterocyclic ring which may contain a further hetero group selected from oxygen, sulfur and —N—R^4, wherein said heterocyclic ring is selected from the group consisting of azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl, oxazolinidinyl, pyrazolindinyl, thiazolidinyl, morpholinyl, imidazolidinyl and the further ring nitrogen atom when present bears a substituent R^4, wherein said R^4 is selected from the group consisting of hydrogen, (C_1–C_4)alkyl, hydroxy (C_2–C_4)alkyl, (C_2–C_4)alkanoyl, (C_1–C_4)alkoxycarbonyl, phenyl optionally substituted with 1 to 3 substituents selected from halogeno, hydroxy, (C_1–C_4)alkyl and (C_1–C_4)alkoxy; phenyl (C_1–C_4)alkyl wherein the phenyl ring may be optionally substituted with 1 to 3 substituents selected from halogeno, hydroxy, (C_1–C_4)alkyl, and (C_1–C_4)alkoxy; phenyl (C_1–C_4)alkoxycarbonyl wherein the phenyl ring may be optionally substituted from 1 to 3 substituents selected from halogeno, hydroxy, (C_1–C_4)alkyl and (C_1–C_4)alkoxy, and the pharmaceutically acceptable acid addition salts thereof.

8. A antibacterial composition which comprises a compound of claim **1** present in a quantity sufficient to exhibit antibacterial activity in admixture with a pharmaceutically acceptable carrier.

4,880,790

(GEM-HETEROCYCLODIMETHANAMINE-N,N')PLATINUM COMPLEXES

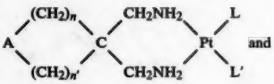
Ralph G. Child, Pearl River; Panayota Bitha, Pomona; Joseph J. Hlavka, Tuxedo, and Yang-I Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

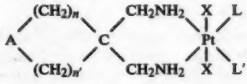
Filed Jan. 31, 1986, Ser. No. 824,404

Int. Cl.[4] A61K *31/35;* C07D *309/04*

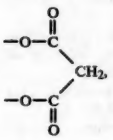
U.S. Cl. 514—184 **19 Claims**

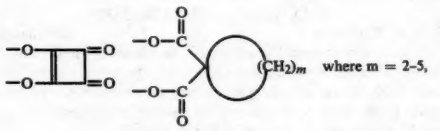
1. A compound selected from those of the formulae:



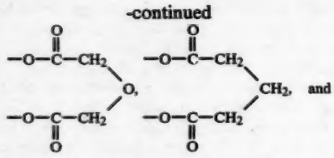


where A is O, n and n' are the same and are 2,; L and L' are selected from the group consisting of halide, nitrate, sulfate, and a monobasic carboxylate selected from the group consisting of acetate, hydroxy acetate and propionate; or L and L' may be a diabsic carboxylate selected from the group consisting of

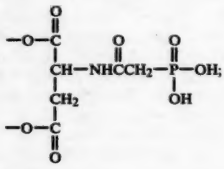




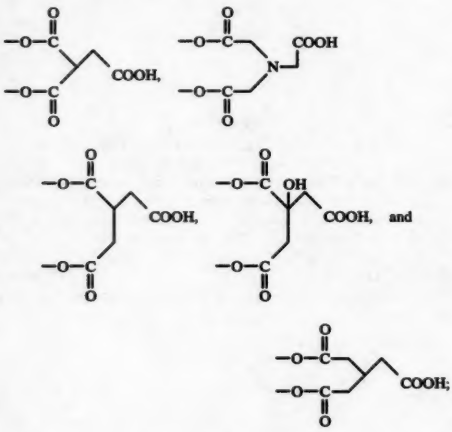
-continued



and



or L and L' taken together may be a tribasic carboxylate seleced from the group consisting of



or L or L' taken together is ascorbic acid and X is selected from the group consisting of halogen and hydroxy.

18. A method of treating melanocarcinomas, lung carcinomas and mammary tumors in warm-blooded animals which comprises administering an effective, oncolytic amount of a compound of claim 1.

4,880,791

COMBINATION PRODUCT COMPOSED OF XANTHINE DERIVATIVES AND O-ACETYLSALICYLIC ACID OR ITS PHARMACOLOGICALLY TOLERATED SALTS, AND ITS USE

Klaus U. Weithmann, Hofheim am Taunus, and Dirk Seiffge, Münxenberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 756,673, Jul. 19, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 219,809

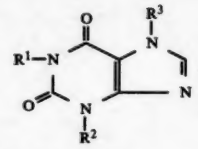
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 34269614; Mar. 7, 1985, 35080973

Int. Cl.[4] A61K *31/62, 31/52, 9/22*

U.S. Cl. 514—161 **20 Claims**

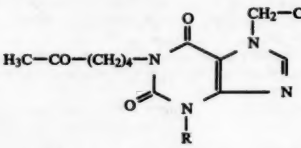
1. A pharmaceutical combination preparation for the treatment of diseases which are caused or characterized by impaired blood ingredients, particularly thrombocytes, erythrocytes or leucocytes, containing an essential ingredients:

(A) a xanthine derivative of the formula I



(I)

in which one of the groups R^1 and R^3 is a straight-chain alkyl, a $(\omega-1)$-oxoalkyl or a $(\omega-1)$-hydroxyalkyl group having 3 to 8 carbon atoms and the two other groups R^2 and R^3, or R^1 and R^2 respectively, are straight-chain or branched alkyl groups having 1 to 8 carbon atoms in the position of R^1 and R^3 and 1 to 4 carbon atoms in the position of R^2, the sum of the carbon atoms of these two alkyl substituents being at most 10, or a xanthine derivative of the formula II



(II)

in which R is an alkyl group of 1 to 4 carbon atoms, or of a prodrug of an oxoalkyl xanthine of the formula I or II or of a hydroxyalkyl xanthine of the formula I, or a metabolite of any xanthine derivative of the formula I or II, and

(B) O-acetylsalicyclic acid or a pharmacologically tolerable salt thereof, each being coated, micro-encapsulated or formulated for delayed release such that component (A) is released to the body from 10 minutes to 4 hour prior to component B,

(C) together with or without a pharmaceutical carrier.

4,880,792

MOLDING INSTALLATION USING DIE

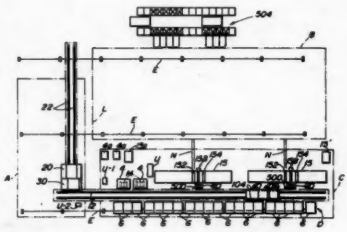
Kenichiro Yoshioka, and Hironori Hisamitsu, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 5, 1987, Ser. No. 117,224

Claims priority, application Japan, Nov. 6, 1986, 61-262717; Nov. 6, 1986, 61-262719; Nov. 6, 1986, 61-262721; Nov. 6, 1986, 61-262722; Nov. 20, 1986, 61-278416; Nov. 20, 1986, 61-179288[U]; Dec. 24, 1986, 61-306213

Int. Cl.[4] B29C *45/03*

U.S. Cl. 425—190 **19 Claims**



1. A molding installation using a die, comprising:

a molding apparatus for effecting the molding with the die;

a stocker having means for storing the die;

a die carriage positionable to transfer the die between the carriage and the molding apparatus and between the car-

riage and the stocker, said carriage having a table for supporting the die and being movable on a path interposed between the molding apparatus and the stocker, said path being located a distance farther from the molding apparatus than from the stocker;

a first die replacing means mounted on the molding apparatus for transferring the die to and from the carriage, and

a second die replacing means mounted on the carriage for transferring the die to and from the stocker.

4,880,793

COMBINATION OF THIENAMYCIN-TYPE ANTIBIOTICS WITH DIPEPTIDASE INHIBITORS

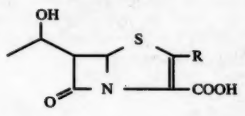
Helmut Kropp, Kenilworth, and Frederick M. Kahan, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 394,311, Jul. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 340,152, Jan. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 291,711, Aug. 10, 1981, Pat. No. 4,539,208, which is a continuation-in-part of Ser. No. 187,929, Sep. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 050,232, Jun. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 927,213, Jul. 24, 1978, abandoned. This application Mar. 14, 1986, Ser. No. 840,532

Int. Cl.[4] A61K *31/24, 31/43, 31/195*

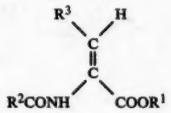
U.S. Cl. 514—192 **32 Claims**

1. An antibacterial composition comprising a combination of a penem having the following structure:



wherein

R is substituted or unsubstituted alkyl having 1 to 6 carbon atoms or —SR′ wherein R′ is substituted or unsubstituted: phenyl or phenyl alkyl having 7–12 carbon atoms, heterocyclyl or heterocyclylalkyl wherein alkyl has 1–3 carbon atoms and the heterocyclic moiety has 1–4 hetero atoms selected from O, N, or S; and the easily removable or pharmaceutically acceptable salt or ester derivatives thereof; and a dipeptidase (E.C.3.4.13.11) inhibitor compound of the following formula:



wherein R^2 and R^3 are hydrocarbon radicals in the range respectively of 3–10 and 1–15 carbon atoms; in these R^2 or R^3 hydrocarbon chains 1–6 hydrogens may be replaced by halogens or a nonterminal methylene may be replaced by oxygen or sulfur, including oxidized forms of the latter; additionally, a terminal hydrogen in R^3 can also be replaced by hydroxyl or thiol, which may be acylated or carbamoylated; or the hydrogen can be replaced by amino, which may be derivatized as in an acylamino, ureido, amidino, guanidino, or alkyl or substituted amino group, including guaternary nitrogen groupings; or, there may be replacement by carboxylic, phosphonic or sulfonic acid groups or esters or amides thereof, or cyano; or combinations thereof, such as a terminal amino acid grouping; and R^1 is hydrogen or lower alkyl (C_{1-6}) or dialkylaminoalkyl, or a pharmaceutically acceptable cation, and the weight ratio of the penem to the dipeptidase inhibitor being within the range of about 1:3 to about 30:1.

4,880,794

PHARMACEUTICAL COMPOSITION AND METHOD FOR THE TREATMENT OF COLITIS ULCEROSA AND CROHN'S DISEASE BY ORAL ADMINISTRATION

Soren Halskov, Granvaenget 3, 3200 Helsinge, Denmark

Continuation of Ser. No. 689,852, Jan. 8, 1985, abandoned, which is a division of Ser. No. 555,533, Nov. 28, 1983, Pat. No. 4,496,553, which is a continuation of Ser. No. 270,517, May 29, 1981, abandoned. This application Jun. 8, 1987, Ser. No. 59,196

Claims priority, application Denmark, Mar. 20, 1980, 1202/80

Int. Cl.[4] A61K *31/615*

U.S. Cl. 514—166 **4 Claims**

1. A method for the treatment of ulcerative colitis or Crohn's disease comprising orally administering an effective amount of a composition consisting essentially of a pharmaceutically acceptable salt of free 5-aminosalicylic acid in admixture with a pharmaceutically acceptable carrier which will control the release of said effective amount of said salt of 5-aminosalicylic acid to be administered according to the actual site of said ulcerative colitis or Crohn's disease in an individual patient.

4,880,795

CEPHALOSPORINS

Rolf Angerbauer; Michael Boberg; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 730,985, May 6, 1985, Pat. No. 4,686,216. This application Mar. 3, 1987, Ser. No. 21,293

Int. Cl.[4] A61K *31/545*; C07D *501/46*

U.S. Cl. 514—202 **5 Claims**

1. A cephalosporin which is selected from the group consisting of

7β-[(Z)-2-(2-Aminothiazol-4-yl)-2-methoxyiminoacetamido]-3-(1-ethyl-1-piperidinium)methyl-3-cephem-4-carboxylate and

7β[(Z)-2-(2-Aminothiazol-4-yl)-2-methoxyiminoacetamido]-3-(4-ethyl-4-morpholinium)methyl-3-cephem-4-carboxylate or a pharmaceutically acceptable salt thereof.

4,880,796

ANTIMICROBIAL PREPARATION

Yoshiya Yamahira, Ibaraki; Yoshiko Okuzawa, Nishinomiya; Keiji Fujioka; Shigeji Sato, both of Ibaraki, and Reimei Ishikawa, Sakado, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Yamanouchi Pharmaceutical Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 732,809, May 10, 1985, abandoned, which is a continuation of Ser. No. 525,258, Aug. 22, 1983, abandoned, which is a continuation of Ser. No. 305,710, Sep. 25, 1981, abandoned. This application Apr. 9, 1987, Ser. No. 36,201

Claims priority, application Japan, Oct. 1, 1980, 55-137939

Int. Cl.[4] A61K *31/545*

U.S. Cl. 514—206 **6 Claims**

1. A solid preparation for injection use which comprises an antimicrobially effective amount of compound A which is D-7-[α-(4-hydroxy-6-methylnicotinamido)-4-hydroxyphenylacetamido]-3-(1-methyltetrazol-5-yl)thiomethyl-Δ^3-cephem-4-sodium carboxylate and from 50 to 200 mg. per 1 gm. potency unit of D-7-[α-(4-hydroxy-6-methylnicotinamido)-4-hydroxyphenylacetamido]-3-(1-methyltetrazol-5-yl)thiomethyl-Δ^3-cephem-4-sodium carboxylate of a stabilizer selected from the group consisting of benzoic acid and sodium benzoate, and a suitable amount of a pharmaceutically acceptable pH-adjustable compound in an amount sufficient to adjust pH of an injectable aqueous solution to a range of 6 to 9 when said solid preparation is reconstituted as an

injectable aqueous solution prior to the injection, formed by the steps of:

(a) forming an aqueous solution of compound A, said stabilizer and said pH-adjustable compound; and

(b) freeze-drying the aqueous solution to form said solid preparation.

4,880,797

CEPHALOSPORIN DERIVATIVES AND ANTIBACTERIAL AGENTS

Susumu Nakagawa; Ryuji Mitomo, and Ryosuke Ushijima, all of Okazaki, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

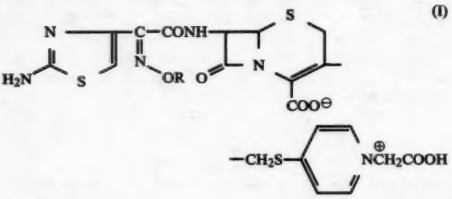
Filed Mar. 20, 1987, Ser. No. 28,576

Claims priority, application Japan, Mar. 20, 1986, 61-60500

Int. Cl.[4] C07C *501/36;* A61K *31/545*

U.S. Cl. 514—206 **8 Claims**

1. A compound having the formula:



(I)

wherein R is a benzyl group which may be substituted by at least one substituent selected from the group consisting of an alkyl group having from 1 to 4 carbon atoms, a hydroxyl group, an alkoxy group having 1 to 4 carbon atoms, an acetoxy group, a carboxyl group, a substituted phenyl group and a halogen atom; or a pharmaceutically acceptable salt, physiologically hydrolyzable ester or solvate thereof.

4,880,798

CEPHALOSPORIN DERIVATIVES

Kazuo Kato, Mishima; Kimihiro Murakami; Hidenori Mochizuki, both of Gotenba, and Ei Mochida, Toshima, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,526

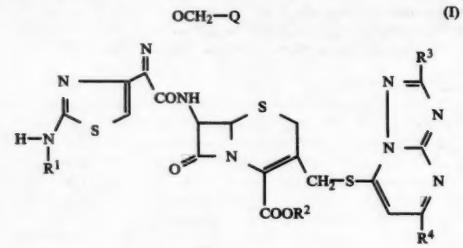
Claims priority, application Japan, Nov. 25, 1986, 61-280020; Nov. 25, 1986, 61-280021; Jan. 26, 1987, 62-015459; Jan. 26, 1987, 62-015460; Jan. 26, 1987, 62-015461

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[4] C07D *501/36;* A61K *31/545*

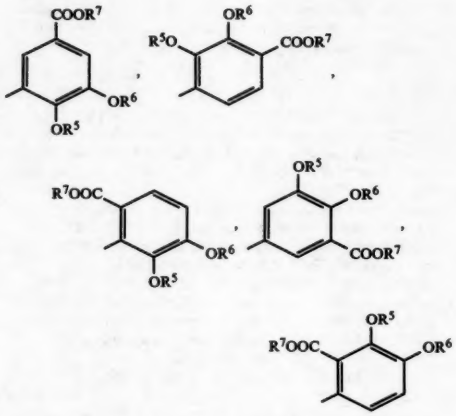
U.S. Cl. 514—206 **15 Claims**

1. A cephalosporin compound of the formula (I):



(I)

and non-toxic salts, non-toxic solvates and non-toxic salts of solvates thereof; wherein R^1 represents a hydrogen atom or an amino-protecting group, R^2 represents a hydrogen atom or a carboxy-protecting group, R^3 represents a hydrogen atom, a hydroxy group, an amino group, a sulfo group, a carboxy group or a protected carboxy group, R^4 represents a hydrogen atom, a methyl group, a carboxy group, a protected carboxy group, a carboxymethyl group or a protected carboxymethyl group, Q represents a group:



wherein R^5 and R^6 are same or different and represent hydrogen atom, hydroxy-protecting group or together a vicinal diol protecting group, and R^7 represents a hydrogen atom or carboxy-protecting group, and the bond shown with a wavy line represents a bond of anti-form or syn-form.

4,880,799

HETEROCYCLIC COMPOUNDS AND THEIR PREPARATION AND USE

Frank Wätjen, and Mogens Engelstoft, both of Vaerloese, Denmark, assignors to A/S Ferrosan, Soeborg, Denmark

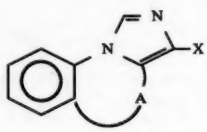
Division of Ser. No. 912,777, Sep. 26, 1986. This application Feb. 2, 1989, Ser. No. 305,970

Claims priority, application Denmark, Oct. 17, 1985, 4768/85

Int. Cl.[4] C07D *513/04, 498/04;* A61K *31/55*

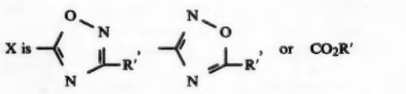
U.S. Cl. 514—211 **12 Claims**

1. Heterocyclic compounds having the formula I



I

wherein



wherein R' is C_{1-6}-alkyl, C_{3-7}-cycloalkyl, or C_{1-3}-alkoxymethyl, and

—A — is $—(CH_2)_n—Y—(CH_2)_m—$, wherein n and m are 1 and —Y— is —O— or —S—.

4,880,800

AMINOCYCLOPENTYL ETHERS AND PHARMACEUTICAL FORMULATION

Christopher J. Wallis, Royton; Harry Finch, Hitchin, and Peter Hallett, Royston, all of England, assignors to Glaxo Group Limited, London, England

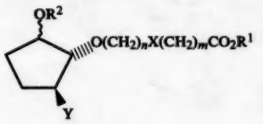
Continuation of Ser. No. 735,181, May 17, 1985, abandoned. This application Sep. 15, 1987, Ser. No. 96,755

Claims priority, application United Kingdom, May 18, 1984, 8412774; Sep. 12, 1984, 8423083

Int. Cl.[4] A61K *31/557*; C07D *267/10, 223/02, 211/22*

U.S. Cl. 514—211 11 Claims

1. Compounds of the formula (I)



(I)

wherein:

R^1 is a hydrogen atom or a methyl group;

X is cis or trans —CH=CH— or $—CH_2CH_2—$, m is 2, 3 or 4 and n is 1; or X is trans —CH=CH—, m is zero and n is 3;

Y is a saturated heterocyclic amino group attached to the cyclopentane ring via the nitrogen atom, said group being selected from the group consisting of pyrrolidine, piperidine, morpholine, piperazine, thiomorpholine, 1,1-dioxothiomorpholine, homomorpholine and hexamethyleneimino; piperazine substituted at the second nitrogen atom by a methyl, ethyl, butyl, hexyl, benzyl or phenethyl group; and any of said groups substituted on a ring carbon atom by one or more C_{1-4} alkyl groups;

R^2 is (i) straight or branched C_{1-5} alkyl substituted by (a) phenyl optionally substituted by C_{1-6} alkyl, C_{5-7} cycloalkyl, phenyl alkyl having a C_{1-3} alkyl portion, thienyl, phenyl (optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy or phenyl, (b) thionyl optionally substituted by C_{5-7} cycloalkyl or phenyl (optionally substituted by C_{1-3} alkyl, C_{1-3} alkoxy or halogen), or (c) naphthyl (optionally substituted by C_{1-4} alkyl or C_{1-4} alkyl or C_{1-4} alkoxy) or (ii) cinnamyl;

and the physiologically acceptable salts and solvents thereof.

9. A pharmaceutical composition comprising a bronchodilating effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

10. A pharmaceutical composition comprising a vasodilating effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

11. A pharmaceutical composition comprising a blood platelet aggregation inhibiting amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

4,880,801

HETEROCYCLIC AMINO COMPOUNDS

John Kitchin, Eastcote; Peter C. Cherry, South Harrow; Adrian J. Pipe; Andrew J. Crame, both of Greenford, and Alan D. Borthwick, London, all of England, assignors to Glaxo Group Limited, London, England

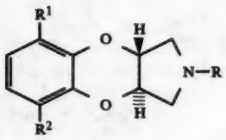
Continuation of Ser. No. 930,891, Nov. 17, 1986, abandoned, which is a continuation of Ser. No. 726,604, Apr. 24, 1985, abandoned. This application May 26, 1988, Ser. No. 198,971

Claims priority, application United Kingdom, Apr. 24, 1984, 8410456; Feb. 15, 1985, 8503975

Int. Cl.[4] A61K *31/55, 31/40*; C07D *209/56*

U.S. Cl. 514—215 15 Claims

1. A compound of formula (I):



wherein

R is a hydrogen atom or a group selected from C_{1-6} alkyl unsubstituted or substituted by C_{3-7} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, C_{3-7} cycloalkyl, phenalkyl in which the alkyl moiety contains 1–5 carbon atoms, and —CHO; R^1 is a group selected from halogen, C_{1-4} alkyl, or hydroxyl; and

R^2 is a hydrogen atom or a substituent as defined above for R^1;

and the physiologically acceptable salts thereof.

10. An alpha$_2$-adrenoreceptor antagonist composition comprising a pharmaceutically effective amount of an alpha$_2$-adrenoreceptor antagonist compound selected from the group consisting of compounds of formula (I), claim 1, physiologically acceptable salts thereof and their mixtures, together with a physiologically acceptable carrier or excipient.

4,880,802

SUBSTITUTED BASIC 2-AMINOTETRALIN USEFUL AS CARDIOTONIC AGENTS

Rudolf Schohe, Wuppertal; Thomas Glaser, Rössrath; Jörg Traber, Lohmar, all of Fed. Rep. of Germany, and George S. Allen, Nashville, Tenn., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

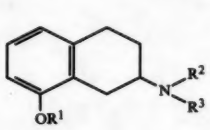
Filed Dec. 8, 1987, Ser. No. 130,373

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642192; Jun. 1, 1987, 3718317

Int. Cl.[4] C07D *279/02*; A61K *31/54*

U.S. Cl. 514—222.2 10 Claims

1. A substituted basic 2-aminotetralin of the formula



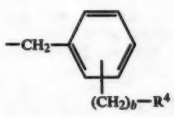
(I)

in which

R^1 represents hydrogen or alkyl,

R^2 represents hydrogen, alkyl or acyl, and

R^3 represents a group of the formula $—(CH_2)_a—R^4$, $—CH_2—CH=CH—(CH_2)_b—R^4$ or $—CH_2—C\equiv C—(CH_2)_b—R^4$,

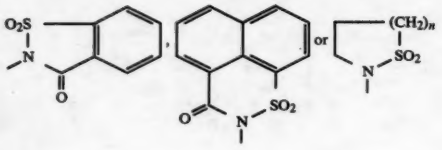


wherein

a denotes a number from 1 to 10, and

b denotes a number 0, 1, 2, 3 or 4, and

R^4 denotes



wherein

n denotes a number 1 or 2, or its salt.

9. A method of treating a patient suffering from a disorder of the central nervous system, the cardiovascular system or the intestinal tract comprising administering to such patient an amount effective therefor of a compound or salt according to claim **1**.

4,880,803

METHOD OF INDUCING IMMUNOSTIMULATING ACTIVITY

Francoise Delevallee, Fontenay Sous Bois; Roger Deraedt, Pavillons Sous Bois, and Josette Benzoni, Livry Gargan, all of France, assignors to Roussel Uclaf, Paris, France

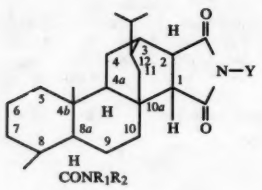
Continuation of Ser. No. 898,241, Aug. 8, 1986, abandoned. This application Oct. 1, 1987, Ser. No. 103,919

Claims priority, application France, Aug. 22, 1985, 85 12619

Int. Cl.[4] A61K *31/535, 31/50, 31/495, 31/40*

U.S. Cl. 514—232.8 **5 Claims**

1. A method of inducing immunostimulating activity in warm-blooded animals in need of said activity comprising administering to warm-blooded animals in need of immunostimulating activity an effective immunostimulating amount of a maleo-pimaric acid compound of the formula



I

"wherein R_1 and R_2 together with the nitrogen atom form a group selected from the group consisting of morpholino, piperazin-1-yl, pyrrolididno, 4-alkylpiperazin-1-yl of 1 to 5 alkyl carbon atoms and 4-hydroxyalkyl-piperazin-1-yl of 1 to 5 alkyl carbon atoms and Y is selected from the group consisting of hydrogen, amino and B-hydroxythyl".

4,880,804

ANGIOTENSIN II RECEPTOR BLOCKING BENZIMIDAZOLES

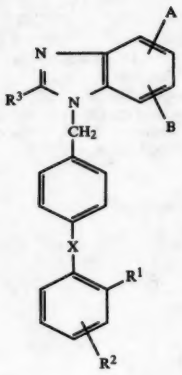
David J. Carini, Wilmington; John Jonas V. Duncia, Newark, both of Del., and Sung-Eun Yoo, Daejeon, Rep. of Korea, assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jan. 7, 1988, Ser. No. 142,053

Int. Cl.[4] A61K *31/535;* **C07D** *233/56*

U.S. Cl. 514—234.5 **13 Claims**

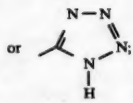
12. Method of treating hypertension in a warm-blooded animal comprising administering to the animal in an amount effective to lower the animal's blood pressure a compound of the formula:



(I)

where

R^1 is $-CO_2H$, $-NHSO_2CF_3$,



R^2 is H, halogen, NO_2, methoxy, or alkyl of 1 to 4 carbon atoms;

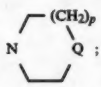
R^3 is alkyl of 1 to 6 carbon atoms, alkenyl or alkynyl of 3 to 6 carbon atoms each of which may be unsubstituted or substituted with a halogen atom, $-OR^4$ or up to two $-CO_2R^4$; with the proviso that when R^3 is methyl it must be substituted with $-OR^4$ or $-CO_2R^4$;

R^4 is H, or alkyl of 1–4 carbon atoms;

R^5 is H, alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, $(CH_2)_mC_6H_5$, OR^6, or NR^7R^8;

R^6 is H, alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or phenyl;

R^7 and R^8 independently are H, alkyl of 1 to 4 carbon atoms, phenyl, benzyl or taken together with nitrogen form a ring of the formula

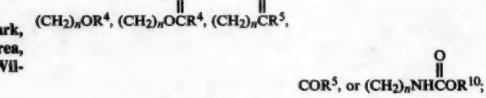


Q is NR^9, O, or CH_2;

R^9 is H, alkyl of 1 to 4 carbon atoms, or phenyl;

R^{10} is alkyl of 1 to 6 carbon atoms;

A is H, alkyl of 1 to 10 carbon atoms, C_rF_{2r+1} where r=1–6, C_6F_5, halogen, alkoxy of 1 to 6 carbon atoms;



B is H, alkyl of 1 to 10 carbon atoms, C_rF_{2r+1} where r=1–6, C_6F_5, halogen or alkoxy of 1 to 6 carbon atoms;

X is a carbon-carbon single bond, —CO—, —O—, —NH-CO—, or $-OCH_2-$;

n is 1 to 6;

m is 0 to 3;

p is 0 or 1;
or a pharmaceutically acceptable salt thereof;
provided that:
(1) when R^3 is methyl it must be substituted with $—OR^4$ or $—CO_2R^4$;
(2) when R^3 is $—CH=CH—CO_2Et$, then X is not —NHCO;
(3) when R^3 is CH_2OH, $CH=CHCO_2H$ or $CH_2CH_2CO_2H$ and A and B are hydrogen, then X cannot be a carbon-carbon single bond;
(4) when R^1 is $—CO_2H$, R^3 is butyl, and X is a carbon-carbon single bond, then A is not 5-Cl;
(5) when R^1 is $—CO_2H$, R^3 is CH_2OCH_3 and X is a carbon-carbon single bond, then A is not 5-CH_2OH.

4,880,805

USE OF ALKYLENEDIAMINE DERIVATIVES FOR THE TREATMENT OF BLOOD FLOW DISTURBANCES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Erwin Böhm, Ladenburg; Jens-Peter Hölck, Mannheim; Wolfgang Kampe, Heddesheim; Herbert Leinert, Heppenheim; Bernd Müller-Beckmann, Grünstadt, and Klaus Strein, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

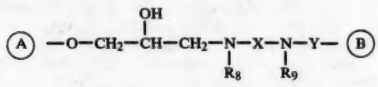
Division of Ser. No. 6,275, Jan. 20, 1987, Pat. No. 4,780,474, which is a continuation-in-part of Ser. No. 759,909, Jul. 29, 1985, abandoned. This application Jul. 21, 1988, Ser. No. 222,215

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428525

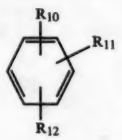
Int. Cl.[4] A61K *31/535, 31/415, 31/505, 31/40*

U.S. Cl. 514—237.5 **11 Claims**

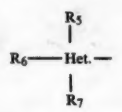
1. Method for treating a blood flow disturbance characterized by reduced deformability of erythrocytes comprising administering to a subject with such a blood flow disturbance, in an amount effective to increase the deformability of erythrocytes in the blood an alkylenediamine of the formula:



wherein Ⓐ is a phenyl radical of the formula



wherein R_{10}, R_{11} and R_{12}, are individually selected from the group consisting of hydrogen, halogen, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, lower alkylthio of 1 to 6 carbon atoms, nitro, amino and lower acylamine of 1 to 6 carbon atoms or R_{10} and R_{11} can together represent a saturated or unsaturated trimethylene chain or an alkylenedioxy group of 1 to 6 carbon atoms and B is a mono-, di- or tricyclic heteroaromatic or hydroheteroaromatic of the formula:



wherein

R_5, R_6 and R_7, are individually selected from the group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms, benzyl, lower alkanoyl of 1 to 6 carbon atoms, cyano, hydroxymethyl, lower alkoxycarbonyl wherein the alkoxy contains 1 to 6 carbon atoms, carbamoyl and divalent oxygen or sulphur, R_8 is hydrogen or lower alkyl of 1 to 6 carbon atoms, and R_9 is hydrogen or lower alkyl of 1 to 6 carbon atoms,

X is straight-chained or branched alkylene chain containing up to 6 carbon atoms,

Y is a valency bond or a C=O group and their pharmacologically acceptable salts.

4,880,806

1-CYCLOPROPYL-6-FLUORO-7-PIPERAZINYL-1,4-DIHYDRO-4-OXO-QUINOLINE-3-CARBOXYLIC ACID DERIVATIVES

Hiraki Ueda; Hisashi Miyamoto; Shinji Aki, all of Tokushima, and Tatsuya Otsuka, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 17,247, Feb. 20, 1987, abandoned. This application Jul. 23, 1987, Ser. No. 76,890

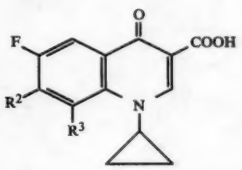
Claims priority, application Japan, Feb. 25, 1986, 61-40921; May 8, 1986, 61-105655; May 22, 1986, 61-118568; Jul. 23, 1986, 61-173370; Aug. 19, 1986, 61-193838; Sep. 30, 1986, 61-233837; Oct. 15, 1986, 61-246050; Dec. 18, 1986, 61-303515; Feb. 19, 1987, 62-37000

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/495;* **C07D** *405/14, 403/04*

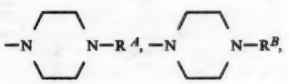
U.S. Cl. 514—249 **46 Claims**

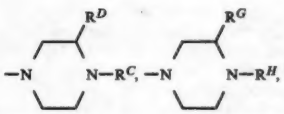
1. A compound of the formula:

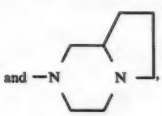


[1]

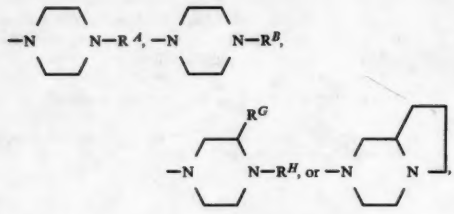
wherein R^2 is a heterocyclic group selected from the group consisting of the following groups:



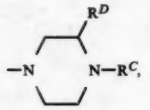




in which R^A is hydrogen, a C_1–C_6 alkyl or a phenyl(C_1–C_6)-alkyl, R^B is a 2-oxo-1,3-dioxolenemethyl substituted by a C_1–C_6 alkyl, or a C_3–C_8 cycloalkyl, R^C is hydrogen, a C_1–C_6 alkyl, a C_1–C_6 alkoxycarbonyl, or a phenyl(C_1–C_6)alkyl, R^D is hydrogen or a C_1–C_6 alkyl, R^G is a C_1–C_6 alkyl, and R^H is a C_1–C_6 alkyl, a phenyl(C_1–C_6)alkyl, or a C_1–C_6 alkanoyl, and R^3 is a C_1–C_6 alkyl when R^2 is a group of the formula:



or R^3 is a C_1–C_6 alkyl having 1 to 3 substituents selected from the group consisting of hydroxy and C_1–C_6 alkoxy when R^2 is a group of the formula:



or a pharmaceutically acceptable salt thereof.

25. A method for the treatment of infectious diseases, which comprises administering an effective amount of the compound as set forth in claim 1 to a subject suffering from the infectious diseases.

4,880,807

NICOTINOYLPIPERAZINES USEFUL FOR TREATMENT OF CONVULSIONS

Bernard Danree, Poissy; Michelle Faulques, Courbevoie; Jean-Yves Lacolle, La Celle-Saint-Cloud, and Jean-Pierre Riffaud, Versailles, all of France, assignors to Institut De Recherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.), Vicq, France

Filed Dec. 7, 1988, Ser. No. 281,248

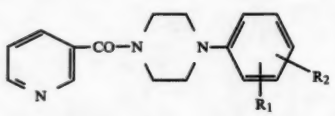
Claims priority, application France, Dec. 16, 1987, 8717563

Int. Cl.[4] A61K *31/505, 31/44;* **C07D** *401/12*

U.S. Cl. 514—252 **16 Claims**

1. A compound belonging to the family of the nicotinoylpiperazines, which is selected from the group consisting of:

(i) 4-aryl-1-nicotinoylpiperazines of the formula



(I)

in which R_1 and R_2, which can be identical or different, each represent the hydrogen atom, a halogen atom or a CF_3, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_2–C_4-acyl group; and

(ii) a non-toxic addition salt thereof.

4,880,808

N-ARYL-PIPERAZINEALKANAMIDES USEFUL FOR IMPROVING SLEEP

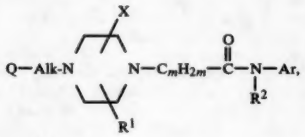
Georges H. P. Van Daele, Kongostraat; Freddy F. Vlaeminck, Veldstraat, and Marc G. C. Verdonck, Waterloopstraat, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 34,129, Apr. 1, 1987, abandoned. This application Mar. 9, 1988, Ser. No. 165,965

Int. Cl.[4] A61K *31/495, 31/44, 31/47, 31/40;* **C07D** *295/10, 295/12, 403/12, 403/14*

U.S. Cl. 514—255 **28 Claims**

1. A method of improving sleep in warm-blooded animals suffering from sleep disorders, which method comprises the administration of an amount effective in improving sleep of a compound of the following formula (I):



(I)

a stereochemically isomeric form or a pharmaceutically acceptable acid addition salt thereof, wherein:

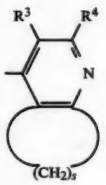
R^1 is hydrogen or C_{1-6}alkyl;

X is C_{1-6}alkyl, hydroxyC_{1-6}alkyl, C_{1-6}alkyloxyC_{1-6}alkyl, aminocarbonyl, mono- and di(C_{1-6}alkyl)aminocarbonyl, carboxyl, C_{1-6}alkyloxycarbonyl, (aminocarbonyl)C_{1-6}alkyl, C_{1-6}alkyl, carboxylC_{1-6}alkyl, (C_{1-6}alkyloxycarbonyl)C_{1-6}alkyl or (hydroxyC_{1-6}alkyl)aminocarbonyl;

m is the integer 1 or 2;

R^2 is hydrogen or C_{1-6}alkyl;

Ar is phenyl, optionally substituted with up to 3 substituents each independently selected from the group consisting of hydroxy, C_{1-6}alkyl, C_{1-6}alkyloxy, halo, trifluoromethyl, C_{1-6}alkylcarbonyl, mono- and di(C_{1-6}alkyl)aminocarbonyl, aminocarbonyl, C_{1-6}alkylcarbonyl, nitro, cyano, amino, aminomethyl, mono- and di(C_{1-6}alkyl)amino, (C_{1-6}alkylcarbonyl)amino, (aminocarbonyl)amino and phenylmethoxy; pyridinyl, optionally substituted with up to three substituents independently selected from halo and C_{1-6}alkyl; pyrazolyl, optionally substituted with up to three substituents independently selected from halo and C_{1-6}alkyl; or a radical of the following formula (a):



(a)

wherein R^3 and R^4 are each independently selected from the group consisting of halo, C_{1-6}alkyl, hydroxy and C_{1-6}alkyloxy and s is the integer 3, 4 or 5;

Alk is a C_{1-6}alkanediyl radical or a C_{3-6}alkenediyl radical, said C_{1-6}alkanediyl radical being optionally substituted with a hydroxy or a C_{1-6}alkyl radical; and

Q is aryl, aryloxy, diarylmethoxy, 2,2-diarylethenyl, diarylmethylcarbonyl, arylcarbonyl, mono- and diarylaminocarbonyl, diarylmethyl or arylamino, the amino moiety in said arylamino being optionally substituted with aryl, an arylcarbonyl, a C_{1-6}alkylcarbonyl, an arylsulfonyl or a C_{1-6}alkylsulfonyl radical; wherein aryl is phenyl, substituted phenyl, naphthalenyl, thienyl or pyridinyl, said substituted phenyl having from 1 to 2 substituents, each

independently selected from the group consisting of halo and C_{1-6}alkyloxy,

said pyridinyl, pyrazolyl and thienyl being attached through a ring carbon thereof.

4,880,809

1,4-DISUBSTITUTED PIPERAZINES (OR HOMOPIPERAZINES) AS PLATELET-ACTIVATING FACTOR ANTAGONISTS

Hirosada Sugihara; Katsumi Itoh, both of Osaka, and Kohei Nishikawa, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

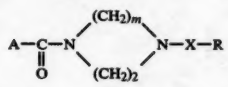
Filed Mar. 14, 1988, Ser. No. 167,961

Claims priority, application Japan, Mar. 24, 1987, 62-69804

Int. Cl.[4] A61K *31/495, 31/55;* **C07D** *295/10, 243/08*

U.S. Cl. 514—255 **25 Claims**

1. A compound of the formula (I):



where A is a group selected from the class consisting of pentalenyl, indenyl, indanyl, naphthyl, dihydronaphthyl tetrahydronaphthyl, hexahydronaphthyl, azulenyl, heptalenyl, biphenylenyl, indacenyl, acenaphythylenyl, acenaphthenyl, phenalenyl, phenanthryl, dihydrophenanthryl, tetrahydrophenanthryl, hexahydrophenanthryl, anthryl, dihydroanthryl, tetrahydroanthryl, hexahydroanthryl, octahydroanthryl, fluorenyl, dihydrofluorenyl, tetrahydrofluorenyl, benzocycloheptenyl, tetrahydrobenzocycloheptenyl, dibenzocycloheptenyl, naphthocycloheptenyl, dihydronaphthocycloheptenyl, benzocyclooctenyl, dihydrobenzocyclooctenyl, tetrahydrobenzocyclooctenyl, hexahydrobenzocyclooctenyl and octahydrobenzocyclooctenyl, which may be substituted by one or two groups selected from the class consisting of a lower alkyl group, a halo lower alkyl group, a hydroxy lower alkyl group, a C_{2-5} alkanoyloxy lower alkyl group, a benzoyloxy lower alkyl group, a lower alkoxy-lower alkyl group, a lower alkoxy group, a halo lower alkoxy group, a lower alkoxy carbonyl-lower alkoxy group, a lower alkenyloxy group, a phenyl lower alkyloxy group, a lower alkoxy-lower alkoxy group, a lower alkoxycarbonyl group, carboxyl group, carbamoyl group, an N,N-di-lower alkylcarbamoyl group, an N-lower alkyl carbamoyl group, a halo group, a cyano group, a nitro group, a hydroxy group, an C_{2-5} alkanoyloxy group, a benzoyloxy group, an amino group, a lower alkylsulfonylamino group, a C_{2-5} alkanoylamino, a benzoylamino group, a lower alkoxycarbonylamino group, C_{2-5} alkanoyl group, a benzoyl group, a mercapto, a lower alkylthio group, a lower alkylsulfinyl group, a lower alkylsulfonyl group and oxo group, R is a phenyl group substituted with one to five lower alkoxy groups; X is a methylene group, carbonyl group or thiocarbonyl group; and m is 2 or 3, or a pharmaceutically acceptable salt thereof.

25. A method for inhibiting activities of platelet activating factor in a mammal, which comprises administering to said mammal an amount effective to inhibit activities of platelet activating factor of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,880,810

QUINAZOLINEDIONES AND PYRIDOPYRIMIDINEDIONES

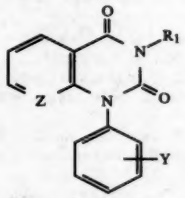
John A. Lowe, III, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 76,976, Jul. 23, 1987, Pat. No. 4,797,403, which is a continuation-in-part of Ser. No. 86/01718, Aug. 2, 1986. This application Jan. 3, 1989, Ser. No. 273,305

Int. Cl.[4] C07D *471/04;* **A61K** *31/505*

U.S. Cl. 514—258 **7 Claims**

1. A compound of the formula



or a pharmaceutically aacceptable acid addition salt thereof, wherein

R_1 is hydrogen, alkyl of 1 to 3 carbon atoms, cyclopentylmethyl, cyclohexylmethyl, norbornylmethyl, bicyclooctylmethyl, or benzyl, the phenyl of the benzyl optionally being substituted by halogen, trifluoromethyl, nitro, carboxy, or CO_2M wherein M is a pharmaceutically acceptable cation;

Y is carboxy, carboalkoxy wherein the alkoxy has 1 to 6 carbon atoms, carbobenzyloxy, carbamoyl N-alkylcarbamoyl wherein the alkyl has 1 to 6 carbon atoms, or CO_2M wherein M is as defined above, and

Z is N.

4,880,811

USE OF C-5 MONO-SUBSTITUTED BARBITURATES TO TREAT DISORDERS OF URIC ACID METABOLISM

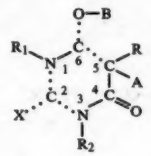
Raymond P. Warrell, Jr., New York, N.Y., assignor to Memorial Hospital for Cancer and Allied Diseases, New York, N.Y.

Filed Jun. 24, 1987, Ser. No. 66,616

Int. Cl.[4] A61K *31/515*

U.S. Cl. 514—270 **26 Claims**

1. A method for decreasing an abnormally high bodily content of uric acid in a subject in need thereof which comprises administrating to the subject an effective content-decreasing amount of a compound having the structure:



wherein:

X is an oxygen, sulfur or hydrogen atom;

R is an alkyl, a cycloalkyl, a phenyl, a phenylalkyl, a a hydroxyphenyl, an amino, a hydroxyl, an aryl comprising an aromatic ring or cyclo moiety bound to an alkyl, N-phenylcarboximido, N-methyl-carboximido, N-ethyl-carboximido, N-propyl-carboximido, N-isopropyl-carboximido, N-butyl-carboximido, N-terbutyl-carboximido, N-pentyl-carboximido, N-isopentyl-carboximido, N-cyclohexenyl-carboximido, N-cyclopentenyl-carboximido, N-methylbutyl-carboximido, N-cycloheptenyl-carboximido, N-(2-bromoallyl)-carboximido, N-(n-hexyl)-

carboximido, N-(1-methyl-2-pentynyl)-carboximido or N-(1-methyl-1-butenyl)-carboximido;

R_1 may be present or absent and if present is a hydrogen atom or a methyl group;

R_2 may be present or absent and if present is a hydrogen atom or a methyl group;

either A or B is present and the other is absent and if present is a hydrogen atom; and

the dotted lines (. . .) represent bonds which may be double or single bonds;

and wherein:

the dotted line (. . .) between C-6 and O is a double bond if A is present and a single bond if B is present;

the dotted line (. . .) between C-6 and C-5 is a double bond if B is present and a single bond if A is present;

the dotted line (. . .) between C-2 and X is a double bond and both R_1 and R_2 are present if X is an oxygen or sulfur atom;

the dotted line (. . .) between C-2 and X is a single bond and either R_1 or R_2 is present and the other is absent if X is a hydrogen atom;

the dotted line (. . .) between N-1 and C-2 is a single bond if R_1 is present and a double bond if R_1 is absent; and

the dotted line (. . .) between N-3 and C-2 is a single bond if R_2 is present and a double bond if R_2 is absent.

4,880,812

PYRIMIDINE COMPOUNDS

James L. Kelley, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

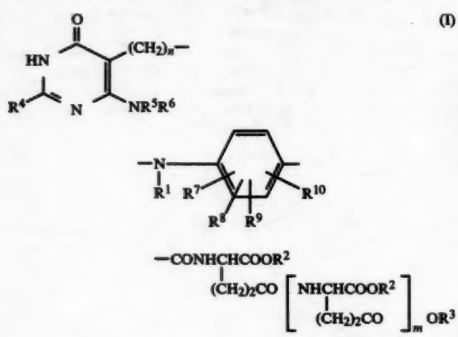
Filed Oct. 16, 1987, Ser. No. 109,225

Claims priority, application United Kingdom, Oct. 18, 1986, 8625019

Int. Cl.[4] A61K *31/505*; C07D *239/49, 239/36*

U.S. Cl. 514—272 **13 Claims**

1. A compound of formula (I):



(I)

wherein R^1 is hydrogen, C_{1-4} alkyl, acetyl or formyl; R^2 and R^3 are the same or different and are hydrogen or C_{1-4} alkyl; R^4 is $NR^{11}R^{12}$, R^{11}, R^{12}, R^5 and R^6 are the same or different and are hydrogen, C_{1-4} alkyl or C_{1-12} acyl; R^7, R^8, R^9 and R^{10} are the same or different and are hydrogen, halo, C_{1-4} haloalkyl, C_{1-4} alkyl and C_{1-4} alkoxy; and n is 2, 3, 4 or 5; m is 0 or an integer from 1 to 6; or a salt thereof.

8. A pharmaceutical formulation, which comprises a compound according to claim 1, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier therefor.

4,880,813

METHOD OF TREATMENT FOR ALLERGIC RHINITIS

Phillip Frost, Miami Beach, Fla., assignor to Baker Cummins Pharmaceuticals, Inc., Miami, Fla.

Filed Jul. 22, 1988, Ser. No. 223,081

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **14 Claims**

1. A method of treating a patient suffering from allergic rhinitis comprising the topical administration to the nasal passages of the patient of a pharmaceutically acceptable liquid solution containing from about 0.5 to about 10.0% by weight of nalmefene or a pharmaceutically acceptable salt thereof.

4,880,814

7-CYCLOALKYL NAPHTHYRIDINES

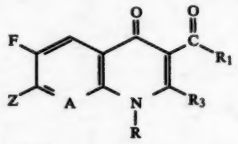
Daniel T. Chu, Vernon Hills; Terry J. Rosen, Deerfield, and Curt S. Cooper, Lake Bluff, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Nov. 13, 1987, Ser. No. 119,885

Int. Cl.[4] C07D *471/04*; A61K *31/44*

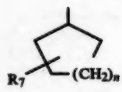
U.S. Cl. 514—300 **7 Claims**

1. A compound having the formula:



wherein R_1 is a hydroxy, a C_1 to C_6 alkoxy, benzoxy, or a C_1 to C_6 alkylcarbonyloxymethoxy group; R_3 is hydrogen; A is nitrogen; R is (1) a C_1 to C_4 alkyl, (2) lower cycloalkyl (3) C_1 to C_4 alkylamino, (4) halo-substituted C_1 to C_4 alkyl, or (5) a phenyl group of the formula:

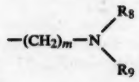
wherein R_4 is one, two or three substituents independently selected from hydrogen, halogen, C_1 to C_4 alkyl, methyldenedioxy, and a group of the formula OR_5, wherein R_5 is hydrogen or C_1 to C_5 alkyl; and Z is a carbocyclic group of the formula:



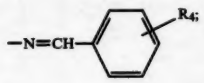
where n is 1 or 2, and R_7 is one or more of (1) hydrogen, (2) halogen, (3) loweralkyl, (4) oxo, (5) cyano, (6) C_1 to C_3 alkanoylamino, (7) carboxyl, (8) nitro, (9) halo-substituted C_1 to C_4 alkyl, (10) phenyl, (11) a substituted phenyl of the formula:

(12) an amine having the formula:

(13) an aminoalkyl group having the formula:



wherein, m is 1 to 4, R_8 and R_9 are independently selected from hydrogen, C_1 to C_4 alkyl, C_1 to C_4 alkylamino, hydroxy substituted C_1 to C_4 alkyl, and amino; or (14) an amine of the formula:



or a pharmaceutically acceptable salt thereof; with the proviso that when R_1 is hydroxy, C_1 to C_6 alkoxy or benzoxy and R is C_1 to C_4 alkyl, or halo-substituted C_1 to C_4 alkyl, then Z is other than cyclopentyl, cyclopentyl substituted by loweralkyl, cyclohexyl or cyclohexyl substituted by loweralkyl.

4,880,815

IMIDAZOPYRIDYL-ALKYLTHIO-PYRIDINES AND ANTI-PEPTIC ULCER COMPOSITIONS CONTAINING THE SAME

Minoru Uchida, Komatsushima; Seiji Morita, Tokushima; Masatoshi Chihiro, Naruto, and Kazuyuki Nakagawa, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

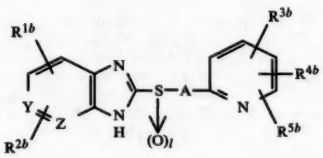
Division of Ser. No. 62,429, Jun. 16, 1987, Pat. No. 4,738,970, which is a continuation of Ser. No. 809,881, Dec. 17, 1985, abandoned. This application Oct. 16, 1987, Ser. No. 109,207

Claims priority, application Japan, Dec. 18, 1984, 59-26706; Dec. 21, 1984, 59-271433; Jul. 2, 1985, 60-145654; Jul. 12, 1985, 60-154708; Nov. 11, 1985, 60-252489

Int. Cl.[4] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—303 **13 Claims**

1. Imidazopyridine compounds and salts thereof represented by the formula



wherein any one of Z and Y is a group of the formula —CH= and the other one is a nitrogen atom —N= R^{1b} and R^{2b} are the same or different from each other, and are each a hydrogen atom, C_1–C_6 alkoxy-carbonyl group, a halogen atom, C_1–C_6 alkyl group, an amino group or a hydroxy group; R^{3b}, R^{4b} and R^{5b} are the same or different from each other, and are each a hydrogen atom, C_1–C_6 alkoxy group or C_1–C_6 alkyl group; A is C_1–C_6 alkylene group; l is 0 to 1; provided that when Y is a group of the formula —CH=, Z is a nitrogen atom —N=, and l is 0, then R^{3b}, R^{4b} and R^{5b} should not all be hydrogen atoms.

4,880,816

BRAIN-SPECIFIC DELIVERY OF DOPAMINE UTILIZING DIHYDROPYRIDINE/PYRIDINIUM SALT-TYPE REDOX CARRIERS

Bodor, Nicholas S., Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Division of Ser. No. 733,463, May 13, 1985, Pat. No. 4,727,079, which is a continuation-in-part of Ser. No. 665,940, Oct. 29, 1984, Ser. No. 516,382, Jul. 22, 1983, Pat. No. 4,540,564, and Ser. No. 461,543, Jan. 27, 1983, which is a continuation-in-part of Ser. No. 379,316, May 18, 1982, Pat. No. 4,479,932, said Ser. No. 665,940, and Ser. No. 516,382, each is a continuation-in-part of Ser. No. 475,493, Mar. 15, 1983, Pat. No. 4,622,218, Ser. No. 461,543, , and Ser. No. 379,316, , said Ser. No. 665,940, is a continuation-in-part of Ser. No. 516,382,. This application Nov. 4, 1987, Ser. No. 116,583

Claims priority, application Canada, May 16, 1983, 428192

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

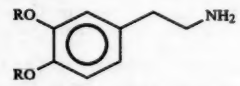
Int. Cl.[4] C07D *213/56, 215/54;* **A61K** *31/44, 31/47*

U.S. Cl. 514—307 **21 Claims**

1. A compound having the formula

[D—DHC] (I),

or a non-toxic pharmaceutically acceptable salt thereof, wherein [D] is a dopamine having the structural formula



in which each R is independently hydrogen or a hydrolytically or metabolically cleavable hydroxyl protective group, and [DHC] is the reduced, biooxidizable, blood-brain barrier penetrating, lipoidal form of a dihydropyridine⇄pyridinium salt redox carrier.

18. A method for site-specifically/sustainedly eliciting a dopaminergic response in the brain, comprising administering to an animal in need of such treatment a quantity of a compound as defined by claim 1 sufficient to elicit a pharmacologically effective dopaminergic response in the brain.

4,880,817

O-FUNCTIONALIZED DERIVATIVES OF SUBSTITUTED ISOQUINOLIN-3-OLS HAVING CARDIOTONIC AND/OR PHOSPHODIESTERASE FRACTION III INHIBITING PROPERTIES AND/OR RENAL VASODILATING PROPERTIES

Ramesh M. Kanojia, Somerville; O. William Lever, Jr., Skillman, and Jeffery B. Press, Rocky Hill, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

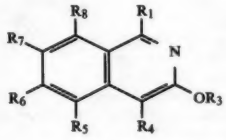
Filed Jun. 9, 1987, Ser. No. 59,699

The portion of the term of this patent subsequent to Dec. 22, 2005, has been disclaimed.

Int. Cl.[4] A61K *31/47;* **C07D** *217/24*

U.S. Cl. 514—309 **15 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, and halogen-substituted radicals thereof; R_3 is selected from the group consisting of lower alkyl,

amino lower alkyl, lower alkylamino lower alkyl, lower dialkylamino lower alkyl, cycloalkyl having 3–7 carbon atoms, alkenyl having 3–5 carbon atoms, alkynyl having 2–5 carbon atoms, and an acyl or sulfonyl radical of the formula $Y(O)_nR$ wherein Y is a carbon atom or a sulfur atom and n is an integer having a value of 1 when Y is carbon and having a value of 2 when Y is sulfur, and R is hydrogen (except when Y is sulfur), lower alkyl, amino lower alkyl, lower alkylamino lower alkyl, lower dialkylamino lower alkyl, cycloalkyl having 3–7 carbon atoms, phenyl C_{1-4}-alkyl, naphthyl C_{1-4}-alkyl, phenyl, substituted phenyl wherein the substituent is methoxy or chloro, naphthyl, lower alkenyl having 3–5 carbon atoms, lower alkynyl having 2–5 carbon atoms, an amino radical of formula NR'R" wherein R' and R" are independently selected from hydrogen, lower alkyl, amino lower alkyl, lower alkylamino lower alkyl, lower dialkylamino lower alkyl, cycloalkyl having 3–7 carbon atoms, phenyl C_{1-4} alkyl, naphthyl C_{1-4} alkyl, phenyl, naphthyl, alkenyl having 3–5 carbon atoms and alkynyl having 2–5 carbon atoms, or R' and R" together with the nitrogen are a heterocyclic ring selected from morpholino, pyrrolidino, piperazino, piperidino, and azepino, or a substituted piperazino ring wherein the substituent is lower alkyl, lower alkoxy carbonyl, phenyl or substituted phenyl wherein the substituent is lower alkoxy, lower alkyl, nitro or halo, or a radical of formula OR"' wherein R"' may be lower alkyl, amino lower alkyl, lower alkylamino lower alkyl and lower dialkylamino lower alkyl, cycloalkyl having 3–7 carbon atoms, phenyl C_{1-4} alkyl, naphthyl C_{1-4} alkyl, phenyl, naphthyl, alkenyl having 3–5 carbon atoms or alkynyl having 2–5 carbon atoms; and

R_4 is selected from the group consisting of nitro, nitroso, an amino radical of the formula NR'R" wherein R' and R" are as defined above, $N(COR')_2$ wherein R' is as defined above, COR' or COOR' wherein R' is as defined above, CONR'R" wherein R' and R" independently are as defined above, $-(CH_2)_x-Z$ wherein x is an integer from 1 to 8, and Z is cyano, OR', OCOR', COOR', or CONR'R" wherein R' and R" independently are as defined above, $N(CONHR')_2$ wherein R' is as defined above, $NHCO(Q)(R')_p$ wherein Q is oxygen or $N(H)_m$ and R' is as defined above, with the proviso that when Q is oxygen, R' is other than hydrogen and p is 1, and that when Q is $N(H)_m$, m and p independently may be zero, 1, or 2 provided that the sum of m and p is 2;

R_5, R_6, R_7, and R_8 may be independently selected from the group consisting of hydrogen, halogen, hydroxy, acyloxy, carbamyloxy, lower alkylcarbamyloxy and lower alkoxy; and R_5 and R_6, R_6 and R_7 or R_8 when taken together may form a methylenedioxy ring.

9. A pharmaceutical composition comprising an effective amount of a compound according to claim 1 as the active ingredient dispersed in a pharmaceutically acceptable carrier.

4,880,818

1-ACYL-4-[1-(4-QUINOLINYL)-HYDRAZIN-2-YLIDENE]-PIPERIDINES AND THEIR USE AS HYPOTENSIVE AGENTS

Karl Schönafinger, Alzenau, Fed. Rep. of Germany, and Helen Hu Ong, Whippany, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 12,715, Feb. 5, 1987, Pat. No. 4,771,052. This application Jul. 12, 1988, Ser. No. 218,749

Int. Cl.[4] A61K *31/47;* **C07D** *401/12*

U.S. Cl. 514—313 **6 Claims**

1. A compound of the formula

where X and Y are each independently hydrogen, loweralkyl, loweralkoxy, hydroxy, halogen, trifluoromethyl or nitro; R_1 is hydrogen or loweralkyl; R_2 is hydrogen or loweralkyl; and R_4 is hydrogen, loweralkyl or aryl, the term aryl signifying a phenyl group optionally substituted with 1, 2 or 3 substituents each of which being independently hydroxy, nitro, loweralkyl, loweralkoxy, halogen or trifluoromethyl, with the proviso that the aryl does not include trinitrophenyl, triiodophenyl or trihydroxyphenyl, or a pharmaceutically acceptable acid addition salt thereof.

4,880,819

4-AMINOPYRIDINE DERIVATIVES FOR IMPROVING IMPAIRED BRAIN FUNCTION

Kunihiro Ninomiya; Ken-Ichi Saito, both of Machida; Shuji Morita; Akihiro Tobe, both of Yokohama, and Issei Nitta, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,333

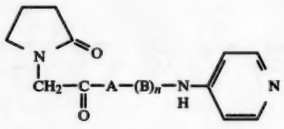
Claims priority, application Japan, Sep. 17, 1987, 62-233350

Int. Cl.[4] A61K *31/445, 31/44;* **C07D** *401/14, 401/12*

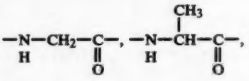
U.S. Cl. 514—316 **2 Claims**

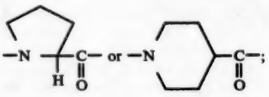
2. A pharmaceutical composition useful as an agent for improving impaired brain function comprising as the effective ingredient a 4-aminopyridine derivative represented by the formula (I):

(I)



wherein A and B independently represent





and n is an integer of 0 or 1; or its pharmaceutically acceptable acid addition salt and a pharmaceutically acceptable carrier therefor.

4,880,820

GUANINE DERIVATIVES

Wallace T. Ashton; Laura F. Canning, both of Clark, N.J.; Arthur K. Field, North Wales, Pa., and Richard L. Tolman, Warren, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

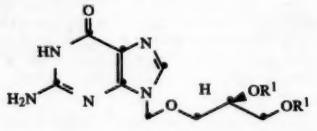
Continuation of Ser. No. 616,910, Jun. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 507,328, Jun. 24, 1983, abandoned. This application Feb. 8, 1988, Ser. No. 150,478

Int. Cl.[4] C07D *473/18;* **A61K** *31/52*

U.S. Cl. 514—322 **12 Claims**

1. A compound of formula:

I



wherein each R^1 is independently H or

where each R^2 is independently alkyl of 1 to 20 carbon atoms which may be straight chain or branched, saturated or mono- or polyunsaturated, and may contain one or more hydroxy, amino, or carboxyl groups, phenyl, phenyl substituted with halogen, phenyl substituted with alkyl of 1 to 4 carbon atoms, phenyl substituted with alkyl of 1 to 4 carbon atoms, pyridyl, piperidyl, furyl, imidazolyl, tetrahydrofuryl, thienyl, phenylalkyl wherein the alkyl moiety has 1 to 4 carbon atoms, alkoxyalkyl wherein both the alkoxy and alkyl moieties contain 1 to 4 carbon atoms, or phenoxy substituted with alkyl having 1 to 4 carbon atoms, or the two R^1 groups together are

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4,880,821

α-NITROALKYLNITROBENZENESULFONAMIDES

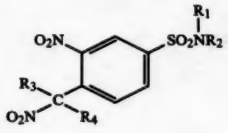
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 17, 1988, Ser. No. 233,316

Int. Cl.[4] A61K *31/445, 31/18;* **C07D** *211/06;* **C07C** *143/80*

U.S. Cl. 514—331 **9 Claims**

1. A compound of the formula:



wherein:

r_1 and r_2 are defined as follows:

R_1 is hydrogen, an alkyl group, or an alkyl group having one or more hydroxy groups;

R_2 is an alkyl group having one or more hydroxy groups, or an amino group in which the amino function is substituted with hydrogen or one or two individual alkyl groups same or different, or two alkyl groups which together form a cyclic amine;

R_3 is hydrogen or an alkyl group; and

R_4 is hydrogen or an alkyl group.

4,880,822

N-(PYRIDINYL)-1H-INDOL-1-AMINES

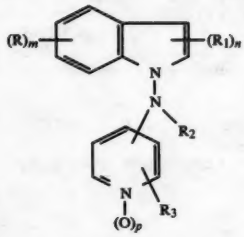
Richard C. Effland, and Joseph T. Klein, both of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 42,079, Apr. 24, 1987, abandoned. This application Apr. 4, 1988, Ser. No. 171,102

Int. Cl.[4] C07D *401/02*

U.S. Cl. 514—339 **54 Claims**

1. A compound having the formula



where m is 1 or 2; n is 1 or 2: p is 0 or 1; each R is independently hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy, nitro, amino, loweralkylamino, cyano, loweralkoxycarbonyl, or loweralkylthio; each R_1 is independently hydrogen, loweralkyl, loweralkenyl, formyl, loweralkylcarbonyl, aryllowerealkylcarbonyl, arylcarbonyl, halogen, arylloweralkenyl, arylloweralkyl, loweralkoxycarbonyllowealkenyl, loweralkoxycarbonyllowealkyl, cyano, —CH(OH)R_4, —C(OH)R_4R_5 or —CH_2OR_5, R_4 being hydrogen, loweralkyl, aryllowealkyl or aryl and R_5 being loweralkyl, aryllowealkyl or aryl; R_2 is independently hydrogen, loweralkyl, loweralkenyl, loweralkynyl, loweralkoxycarbonyllowealkyl, loweralkylaminocarbonyllowealkyl, aminocarbonyllowealkyl, aryllowealkyl, loweralkoxycarbonyl, aryllowealkoxycarbonyl, aryloxycarbonyl, loweralkylaminocarbonyl, aryllowealkylaminocarbonyl, arylaminocarbonyl, alkanoyl, aryllowealkanoyl, aroyl, alkenoyl or alkynoyl; and R_3 is hydrogen, nitro, amino, halogen, loweralkanoylamino, aryllowealkanoylamino, aroylamino, alkylamino, aryllowealkylamino or loweralkyl; the term aryl in each occurrence signifying a phenyl group having 0, 1, 2 or 3 substituents each of which being independently loweralkyl, loweralkoxy, halogen, CF_3, NO_2 or CN: the term loweralkenyl in each occurrence signifying a loweralkenyl group having 2 to 6 carbon atoms; the term loweralkynyl in each occurrence signifying a loweralkynyl group having 2 to 6 carbon atoms; the term alkyl in each occurrence signifying an alkyl group of 1 to 20 carbon atoms; the term alkenyl in each occurrence signifying an alkenyl group having 2 to 20 carbon atoms; and the term alkynyl in each occurrence signifying an alkynyl group having 2 to 20 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

4,880,823

INJECTION OF NICARDINPINE HYDROCHLORIDE AND PROCESS FOR THE PRODUCTION THEREOF

Katayasu Ogawa, Saitama; Go Ohtani; Shoji Yokota, both of Tokyo, and Masayoshi Aruga, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 140,901, Dec. 23, 1987, abandoned, which is a continuation of Ser. No. 925,462, Oct. 30, 1986, abandoned, which is a continuation of Ser. No. 735,558, May 15, 1985, abandoned. This application Apr. 12, 1989, Ser. No. 338,402

Claims priority, application Japan, May 22, 1984, 59-102991

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—356 **7 Claims**

1. A stable, injectable composition of nicardipine hydrochloride in ampoule form comprising an aqueous nicardipine hydrochloride solution containing 0.04 to 0.6 W/V% nicardipine hydrochloride and 2 to 7 W/V% of a polyhydric alcohol and wherein the pH of said solution is from 2.5 to 5, and the percentage of nicardipine hydrochloride remaining in said solution after a 12 week storage period at 60° C. is between 69.24 percent and 74.39 percent.

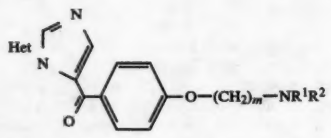
4,880,824

PHENYL AND BENZOYL SUBSTITUTED IMIDAZO-FUSED HETEROCYCLIC CALCIUM CHANNEL BLOCKERS

Jeffery B. Press, Rocky Hill, and Maud Urbanski, Belle Mead, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 21, 1987, Ser. No. 99,417
Int. Cl.[4] A61K *31/425;* C07D *513/04, 487/04*
U.S. Cl. 514—368 19 Claims

1. An imidazo-fused heterocyclic compound of the following formula (II):



(II)

wherein

R^1 and R^2 are independently alkyl of 1 to 5 carbons;

m is an integer from 2 to 5; and

Het represents the atoms necessary to form an imidazo[2,1-b]thiazole ring system,

and the pharmaceutically acceptable acid-addition salts thereof.

5. An anti-hypertensive or anti-anginal pharmaceutical composition which comprises a pharmaceutically effective amount of a heterocyclic compound of claim 1 in combination with a pharmaceutically-acceptable diluent or carrier.

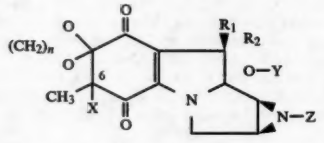
4,880,825

MITOMYCIN DERIVATIVES

Masaji Kasai, Kanagawa; Yutaka Kanda, Tokyo; Motomichi Kono, Tokyo; Yutaka Saito, Tokyo; Makoto Morimoto, and Tadashi Ashizawa, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,219
Claims priority, application Japan, Mar. 25, 1987, 62-71115
Int. Cl.[4] C07D *487/14;* A61L *31/40*
U.S. Cl. 514—409 7 Claims

1. Mitomycin compounds represented by the Formula



(I)

wherein one of R_1 and R_2 represents carbamoyloxymethyl and the other represents hydrogen or R_1 and R_2 are bonded together to form methylene;

X is hydrogen or halogen;

Y is hydrogen or methyl;

Z is hydrogen, methyl or acyl of the Formula RCO where R is selected from the group consisting of hydrogen, lower alkyl or 1 to 3 carbon atoms, phenyl, p-nitrophenyl and naphthyl; and

n is an integer of 2 or 3.

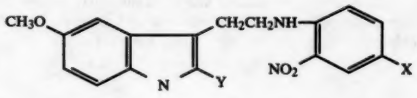
4,880,826

MELATONIN ANTAGONIST

Nava Zisapel, 23 Kissufim St., and Moshe Laudon, 14 Anderson St., both of Tel Aviv, Israel

Filed Jun. 25, 1987, Ser. No. 66,351
Claims priority, application Israel, Jun. 27, 1986, 79264
Int. Cl.[4] A61K *31/405*
U.S. Cl. 514—415 5 Claims

1. A pharmaceutical or veterinary composition including a physiologically acceptable carrier and containing as active ingredient a physiologically effective dosage of 5-methoxytryptamine of the formula:



wherein

X is $—NO_2$ or $—N_3$, and

Y is —H or —I.

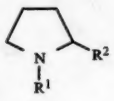
4,880,827

PYRROLIDINE DERIVATIVES HAVING INHIBITORY ACTION FOR PROLINE SPECIFIC ENDOPEPIDASE

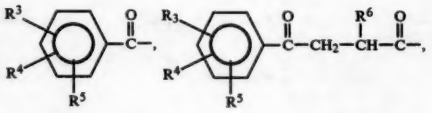
Katsumi Tamoto; Renzo Ohuchi, both of Toyonaka, and Keiichi Ono, Sakai, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Ltd., Osaka, Japan

Filed Mar. 13, 1987, Ser. No. 25,664
Claims priority, application Japan, Mar. 18, 1986, 61-61693; Mar. 20, 1986, 61-63505
Int. Cl.[4] C07D *207/08, 207/09;* A61K *31/40*
U.S. Cl. 514—423 8 Claims

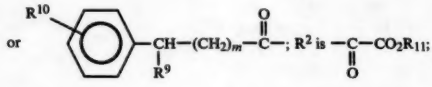
1. A compound of the formula:



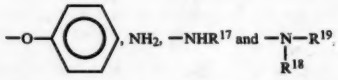
wherein R^1 is



or

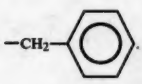


R^3, R^4 and R^5 are each independently hydrogen, hydroxy, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, phenyl unsubstituted or substituted with at least one substituent selected from the group of consisting of halogen, C_{1-4} alkyl and C_{1-4} alkoxy,



wherein R^{17} is C_{1-4} alkyl; R^{18} and R^{19} are each independently C_{1-4} alkyl; R^6 is hydrogen or C_{1-4} alkyl; R^9 is hydrogen, C_{1-4} alkyl or phenyl; R^{10} is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy or

halogen; m is an integer of 0 to 3 and R^{11} is hydrogen, C_{1-4} alkyl, phenyl or



7. A method of treating a patient suffering from dementia comprising administering at least one dose to said patient of the compound according to claim 1, at a daily dosage of between 1 mg and 1000 mg/kg of body weight.

4,880,828
2-(TETRAHYDRO-2-THIENYL)PHENYL ESTERS OF PHOSPHOROTHIOIC ACID

Anupama Mishra, Guelph, Canada, and Richard C. Moore, Wallingford, Conn., assignors to Uniroyal Chemical, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd./Ltee, Don Mills, Canada

Filed Jan. 29, 1988, Ser. No. 149,774
Int. Cl.[4] A61K *31/38;* **C07D** *333/46*
U.S. Cl. 514—438 **13 Claims**

1. A compound having the structural formula where
R is C_1–C_6 alkyl;
R^1 to R^4 are the same or different and are hydrogen, halogen, nitro, C_1–C_8 alkyl, C_1–C_2 haloalkyl, C_5–C_6 cycloalkyl, C_1–C_3 aralkyl, phenyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkylsulfinyl, C_1–C_6 alkylsulfonyl, C_1–C_3 alkoxy substituted phenyl, phenoxy, phenylthio, phenylsulfonyl, phenylsulfinyl, tetrahydro-2-thienyl, dioxytetrahydro-2-thienyl, C_2–C_5 alkoxycarbonyl or $N(R^5,R^6)$;
R^5 and R^6 are the same or different and are hydrogen or C_1–C_2 alkyl;
X and Y are the same or different and are oxygen or sulfur; and
n is 0, 1 or 2.

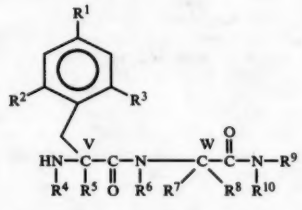
9. A method of controlling insects comprising applying an insecticidally effective amount of the compound of claim 1 to the locus to be protected.

4,880,829
SUBSTITUTED DIPEPTIDE AMIDES #3

Donald W. Hansen, Jr., Chicago; Barnett S. Pitzele; Michael Clare, both of Skokie, and Robert W. Hamilton, Wilmette, all of Ill., assignors to G. D. Searle and Company, Chicago, Ill.

Division of Ser. No. 882,794, Jul. 14, 1986, Pat. No. 4,822,775, which is a continuation-in-part of Ser. No. 829,266, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 765,882, Aug. 14, 1985, abandoned. This application Jan. 20, 1988, Ser. No. 146,006
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.
Int. Cl.[4] A61K *31/38;* **C07D** *333/22*
U.S. Cl. 514—445 **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof:
wherein R^1 is hydrogen, lower alkyl, hydroxy, lower alkoxy, —OCO_2-lower alkyl, $O(CH_2)_m$-phenyl with the phenyl optionally substituted by a member of the group comprising halogen, —NO_2, —CN, —NH_2, or lower alkyl;
wherein m is an integer from 1 to 4;
wherein R^2 and R^3 represent lower alkyl, halogen or lower alkoxy, or either one of R^2 or R^3 is hydrogen and the other is lower alkyl, halogen or lower alkoxy;
wherein R^4, R^5, R^6, R^7, R^8 and R^9 may be the same or different and represent hydrogen or lower alkyl;
wherein R^{10} is selected from the group consisting of

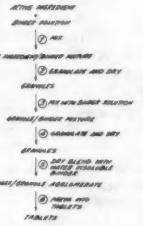
—(ALK)X

wherein ALK represents alkylene, thioalkylene, or oxyalkylene having 1 to 5 carbon atoms; alkenylene or alkynylene having 2 to 4 carbon atoms; and
wherein X represents 2-thienyl or 3-thienyl with the proviso that X may represent 3-thienyl only when ALK is not alkylene;
wherein V represents an asymmetric carbon atom that may be racemic or have the D or L configuration; and
wherein W represents an asymmetric carbon atom when R^7 and R^8 are not the same which may be racemic or have the D or L configuration.

4,880,830
SLOW RELEASE FORMULATION

Alan Rhodes, Ely, United Kingdom, assignor to Ethical Pharmaceuticals Limited, United Kingdom

Filed Feb. 9, 1987, Ser. No. 12,026
Claims priority, application United Kingdom, Feb. 13, 1986, 8603523
Int. Cl.[4] A61K *9/16, 9/26*
U.S. Cl. 424—470 **20 Claims**



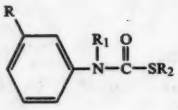
1. A slow release formulation to be administered to humans or animals, comprising (1) granules which comprise particles comprising an active ingredient and a primary matrix of water soluble/dispersible slow release material in which are dispersed said particles comprising the active ingredient, and (2) a secondary matrix of a water soluble/dispersible slow release material in which said granules are dispersed.

4,880,831
FUNGICIDAL CARBANILATES

Don R. Baker, Orinda; Keith H. Brownell, Cupertino, and Charles Kezerian, Orinda, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 607, Jan. 5, 1987, Pat. No. 4,797,416. This application Aug. 1, 1988, Ser. No. 227,037
Int. Cl.[4] C07C *155/02;* **A01N** *47/10*
U.S. Cl. 514—485 **4 Claims**

1. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



wherein R is methoxy or allyloxy; R_1 is hydrogen; and R_2 is C_1–C_6 alkyl.

4,880,832

LIPOSOLUBLE PLATINUM (II) COMPLEX AND PREPARATION THEREOF

Mitsuaki Maeda, Tokyo, and Takuma Sasaki, Kanazawa, both of Japan, assignors to Sumitomo Pharmaceuticals Company, Ltd., Osaka, Japan

Filed Feb. 18, 1988, Ser. No. 156,961

Claims priority, application Japan, Mar. 6, 1987, 62-51237

Int. Cl.[4] A61K *31/28*

U.S. Cl. 514—492 **16 Claims**

1. A platinum II) complex represented by the formula (I):

(I)

wherein R^1 and R^2 each stands for a ligand ammine which may have an organic substituent or may be bonded to each other through a bivalent organic group and both of the R_3 groups are the same and individually represent a residue of a bile acid selected from the group consisting of cholic acid, deoxycholic acid, lithocholic acid, chenodeoxycholic acid, ursodeoxycholic acid and hydeoxycholic acid.

4,880,833

SYNERGISTIC PHARMACEUTICAL COMPOSITIONS, THEIR PRODUCTION AND USE

József Knoll, Budapest, Hungary; Walter Birkmayer, Vienna, d12, 1986, Ser. No. 908,865

Claims priority, application Hungary, Dec. 20, 1983, 4343/83

Int. Cl.[4] A61K *31/195, 31/16, 31/135*

U.S. Cl. 514—565 **8 Claims**

1. A synergistic pharmaceutical composition for the treatment of depression which comprises a therapeutically effective amount of a combination of:

25 to 50 parts by weight of l-phenylalanine; and

1 part by weight of (−)-deprenyl, or the hydrochloride acid addition salt thereof; and a pharmaceutically acceptable inert, nontoxic carrier.

4,880,834

METHOD FOR ADMINISTERING ETHANOLAMINE DERIVATIVES TO LIVESTOCK

Jonathan R. Arch, Banstead, England, assignor to Beecham Group p.l.c., England

PCT No. PCT/GB86/00114, § 371 Date Oct. 30, 1986, § 102(e) Date Oct. 30, 1986, PCT Pub. No. WO86/05075, PCT Pub. Date Sep. 12, 1986

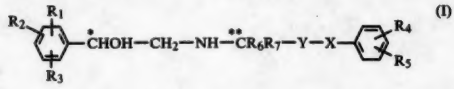
PCT Filed Mar. 3, 1986, Ser. No. 937,030

Claims priority, application United Kingdom, Mar. 1, 1985, 8505284; Aug. 22, 1985, 8521068

Int. Cl.[4] A61K *31/195, 31/235, 31/195, 31/16*

U.S. Cl. 514—567 **6 Claims**

1. A method for treating livestock to decrease birth mortality rate and increase post-natal survival rate, which method comprises the administration to the livestock of an effective, non-toxic amount of a compound of formula (I).



(I)

or a pharmaceutically acceptable salt thereof wherein R^1 is a hydrogen, fluorine or chlorine atom or a hydroxyl, hydroxymethyl, methyl, methoxyl, amino, formamido, acetamido, methylsulphonylamido, nitro, benzyloxy, methylsulphonylmethyl, ureido, trifluoromethyl or p-methoxybenzylamino group; R^2 is a hydrogen, fluorine or chlorine atom or a hydroxyl group; R^3 is a hydrogen or chlorine atom or a hydroxyl group; R^4 is a carboxylic acid group or a salt, ester or amide thereof; R^5 is a hydrogen, chlorine or fluorine atom or a methyl, methoxyl or hydroxyl group or a carboxylic acid group or a salt, ester or amide thereof; R^6 is a hydrogen atom or a methyl, ethyl or propyl group; R^7 is a hydrogen atom or a methyl, ethyl or propyl group; X is an oxygen atom or a bond; and Y is an alkylene group of up to 6 carbon atoms or a bond; which compounds show anti-obesity and/or anti-hyperglycaemic activity or, where appropriate, a veterinarily acceptable salt, ester or amide thereof.

4,880,835

ORAL LIQUID PHARMACEUTICAL COMPOSITIONS OF SULINDAC

Moo K. Park, Rockville, Md., assignor to Formulations Development Labs, Inc., Wilmington, N.C.

Filed Nov. 3, 1988, Ser. No. 266,660

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—570 **8 Claims**

1. A one phase liquid composition for oral administration comprising:

(a) An anti-inflammatory but non-toxic quantity of calcium sulindac selected from the range of 0.5–7% w/v;

(b) a pharmaceutically acceptable quantity of a glycol which is propylene glycol or a polyethylene glycol selected from the range of 15–50% v/v;

(c) a quantity of ethanol selected from the range of 0–20% v/v; and

(d) a pharmaceutically acceptable quantity of a polyol which is glycerin or sorbitol selected from the range of 30–80% v/v.

4,880,836

ANTIVIRAL AMPHIPHILICS

Danek Elbaum, Box 450, Awosting Rd., Pine Bush, N.Y. 12566

Filed Mar. 11, 1988, Ser. No. 166,890

Int. Cl.[4] A61R *31/17*

U.S. Cl. 514—588 **15 Claims**

1. A method for treating viral infections in a warm-blooded animal having a viral infection which comprises administering to said warm-blooded animal an antivirally effective amount of a monosubstituted lower alkyl urea.

4,880,837
N-BENZOYL-N'-(2,3-DICHLORO-4-PHENOXY)-PHENYLUREAS

Wolfgang Seppelt, Bobenheim-Roxheim; Peter Hofmeister, Neustadt, and Christoph Kuenast, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

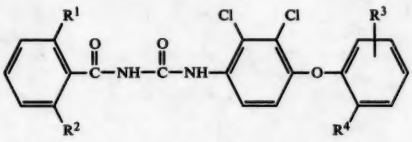
Filed Sep. 19, 1988, Ser. No. 246,268

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731561

Int. Cl.[4] A01N *47/28, 25/00;* **C07C** *127/22*

U.S. Cl. 514—594 **4 Claims**

1. N-Benzoyl-N'-(2,3-dichloro-4-phenoxy)-phenylureas of the general formula I



(I)

where R^1 is halogen, R^2 is hydrogen or halogen, R^3 is halogen or C_1–C_4-haloalkoxy, and R^4 is hydrogen or halogen.

4,880,838
PESTICIDAL 1-(4-PHENOXYPHENYL)-5-BENZOYL UREA COMPOUNDS AND PROCESS FOR PREPARATION

David T. Chou, Raleigh, and Paul A. Cain, Cary, both of N.C., assignors to Rhone-Poulenc, Amstelveen, Netherlands

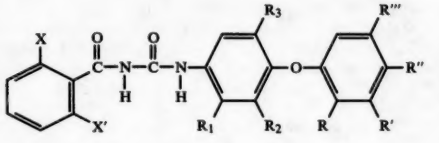
Continuation of Ser. No. 717,784, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 495,331, May 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 393,553, Jun. 30, 1982, abandoned. This application Mar. 7, 1988, Ser. No. 168,619

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.[4] C07C *127/22;* **A01N** *47/34*

U.S. Cl. 514—594 **64 Claims**

1. A compound of the formula:



wherein:

X represents halogen;

X' represents hydrogen or halogen;

R_1, R_2 and R_3 are independently methyl, chlorine or bromine;

R represents methyl, chlorine, fluorine or bromine; and

R', R'' and R''' are independently hydrogen, methyl, chlorine, fluorine or bromine, provided that at least one of R', R'', and R''' is other than hydrogen.

4,880,839
ACYANILIDE DERIVATIVES

Howard Tucker, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

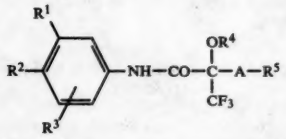
Filed Jun. 16, 1987, Ser. No. 62,691

Claims priority, application United Kingdom, Jul. 18, 1986, 8617652

Int. Cl.[4] A61K *31/65*

U.S. Cl. 514—613 **6 Claims**

1. An acylanilide of the formula:



wherein R^1 is carbamoyl, nitro, fluoro, chloro, bromo, iodo or hydrogen, or alkyl, alkoxy, alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl, perfluoroalkyl, perfluoroalkylthio, perfluoroalkylsulphinyl or perfluoroalkylsulphonyl each of up to 4 carbon atoms, or phenylthio, phenylsulphinyl or phenylsulphonyl; wherein R^2 is carbamoyl, nitro, fluoro, chloro, bromo or iodo, or alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl, perfluoroalkyl, perfluoroalkylthio, perfluoroalkylsulphinyl or perfluoroalkylsulphonyl each of up to 4 carbon atoms, or phenylthio, phenylsulphinyl or phenylsulphonyl; wherein R^3 is hydrogen or halogen; wherein R^4 is hydrogen; wherein A is branched-chain alkylene of up to 6 carbon atoms; and wherein R^5 is phenyl which is unsubstituted or which bears one, two or three substituents selected from halogen, nitro, hydroxy, carboxy, carbamoyl and alkyl, alkoxy, alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl, perfluoroalkyl, perfluoroalkylthio, perfluoroalkylsulphinyl, perfluoroalkylsulphonyl, alkoxycarbonyl and N-alkylcarbamoyl each of up to 4 carbon atoms, and phenyl, phenylthio, phenylsulphinyl and phenylsulphonyl; or R^5 is naphthyl.

4,880,840
ARYLETHANOLHYDROXYLAMINES AND THEIR USE FOR PROMOTING YIELD

Hans Lindel, Leverkusen; Axel Ingendoh, Odenthal; Friedrich Berschauer, Wuppertal; Anno de Jong, and Martin Scheer, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

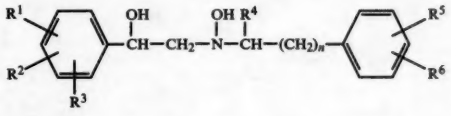
Filed Jun. 30, 1987, Ser. No. 68,398

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623940

Int. Cl.[4] A61K *31/135;* **C07C** *83/04*

U.S. Cl. 514—645 **13 Claims**

1. An arylethanolhydroxylamine of the formula



in which

R^1 represents halogen, CN, NO_2, hydroxyl or optionally substituted alkyl, alkoxy or alkylthio, or furthermore represents alkoxycarbonyl or the radical $—NR^7R^8$,

R^2 represents hydrogen, halogen, CN, hydroxyl or optionally substituted alkoxy, it being possible for the radicals R^1 and R^2, together with the adjacent C atoms, to form an optionally substituted dioxolanyl or dioxanyl ring,

R^3 represents hydrogen or halogen,

R^4 represents hydrogen or alkyl,

R^5 represents hydrogen, optionally substituted alkyl or alkoxy, hydroxyl or halogen,

R^6 represents acyl, acyloxy or alkoxy, which is optionally substituted,

R^7 represents hydrogen or alkyl,

R^8 represents hydrogen, alkyl, formyl (—CHO), acyl or optionally substituted aryl or aralkyl and

n represents 0, 1 or 2, or a physiologically acceptable salt thereof.

12. A method of promoting the yield of animals which com-

prises administering to such animals a yield promoting effective amount of a compound or salt according to claim 1.

4,880,841

PROCESS OF PRODUCING PHENETHYLAMINE DERIVATIVES

Kazuo Imai; Kunihiro Niigata; Takashi Fujikura, all of Saitama; Shinichi Hashimoto, Matsudo; Toichi Takenaka, Tokyo, and Kazuo Honda, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 208,804, Jun. 17, 1988, abandoned, which is a continuation of Ser. No. 82,382, Aug. 6, 1987, abandoned, which is a continuation of Ser. No. 894,464, Jul. 31, 1986, abandoned, which is a continuation of Ser. No. 690,398, Jan. 9, 1985, abandoned, which is a continuation of Ser. No. 517,734, Jul. 28, 1983, abandoned, which is a continuation of Ser. No. 285,782, Jul. 22, 1981, abandoned. This application Feb. 3, 1989, Ser. No. 307,200

Claims priority, application Japan, Jul. 29, 1980, 55-104175; Jun. 15, 1981, 56-92010

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—654 5 Claims

5. A method of producing an antihypertensive action based solely upon an alpha-adrenergic action by administering a therapeutically effective amount of 4-{2-[2-(2-ethoxyphenoxy)ethylamino]-2-methylenthyl}-2-(methylsulfonyl)anisole or its hydrochloric acid salt.

4,880,842

MULTI-STAGE OPACIFYING POLYMER PARTICLES CONTAINING NON-POLYMERIC ACID ABSORBED THEREIN

Alexander Kowalski, Plymouth Meeting, and Martin Vogel, Jenkintown, both of Pa., assignors to Rohm & Haas Company

Filed May 20, 1988, Ser. No. 197,063

Int. Cl.[4] C08J *9/28;* C08F *265/04*

U.S. Cl. 521—64 13 Claims

1. A process for preparing opacifying polymer particles containing one or more void space(s) within said particles comprising:

(A) sequentially emulsion polymerizing polymer particles comprising two or more polymer stages wherein

(1) each of said polymer stages is emulsion-polymerized from a monomer system comprising one or more ethylenically-unsaturated monomer(s) containing one or more —HC═C< group(s);

(2) the final polymer stage of said particles has a glass transition temperature of about 50° C. or greater;

(3) at least one essentially low-acid, earlier polymer stage, other than said final polymer stage (2), is prepared from a monomer system which contains less than about 5% by weight of monomers containing carboxylic acid functionality;

(4) each polymer stage is different from any adjacent polymer stage by either about a one percent difference by weight in the amount of any ethylenically unsaturated monomer used therein or by a difference in number average molecular weight between said stage and said adjacent stage of at least about a factor of 2; and

(5) the polymer stages of said particles having a Tg of about 50° C. or greater comprises at least about 60% by weight of said particles;

(B) contacting said polymer particles with a non-polymeric alipharic or aromatic carboxylic acid(s) having 6 to 12 carbon atoms containing at least one carboxylic acid group before, during or after polymerization of said final polymer stage (2) to pemit said acid-containing compound to be absorbed into said low-acid polymer stage (3); and

(C) swelling the resulting multi-stage polymer particles containing said absorbed acid-containing compound with water, an optical plasticizing solvent, at or above the glass transition temperature of the neat polymer or glass transition temperature of the optionally plasticized polymer of said final polymer stage (2) by contacting said particles with base at a pH sufficient to swell said polymer particles, so as to produce particles which, when dried, contain one or more void space(s) within said particles.

4,880,843

COMPOSITION AND PROCESS FOR MAKING POROUS ARTICLES FROM ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

Harvey L. Stein, Seabrook, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Mar. 28, 1988, Ser. No. 173,988

Int. Cl.[4] C08K *5/01;* C08L *23/06*

U.S. Cl. 521—98 6 Claims

1. A molding powder composition comprising a uniform heterogeneous mixture of particles of polyethylene having a molecular weight within the range of about 1×10^6 to about 6×10^6 as determined by the intrinsic viscosity of a 0.5 weight percent solution in decahydronaphthalene at 135° C., and particles of polyethylene wax having a molecular weight within the range of about 1,000 to about 20,000, the particle size distribution of said particles of polyethylene polymer being within the range of at least about 95% by weight smaller than 0.5 millimeters and not greater than about 15% by weight smaller than 0.063 millimeters.

4,880,844

FLAME LAMINATABLE POLYETHER URETHANE FOAM

Gerald Fesman, Teaneck, N.J., assignor to Akzo America Inc., New York, N.Y.

Filed May 27, 1988, Ser. No. 199,499

Int. Cl.[4] C08G *18/65*

U.S. Cl. 521—107 14 Claims

1. In a urethane foam-forming composition comprising a polyether polyol, organoisocyanate, blowing agent and at least one organophosphorus compound selected from the group consisting of an organophosphite, an organophosphonate, an alkylphosphate and an alkoxyalkylphosphate in an amount effective to impart heat laminatable properties to the resulting foam formed therefrom, wherein the improvement comprises the additional presence of a polyalkylene glycol having a hydroxy number of below about 560 to improve the heat laminatable properties of the resulting foam.

4,880,845

AMINO/ORTHO CARBOXYLIC ACID ESTER CATALYST SYSTEM FOR ISOCYANATE TRIMERIZATION

Christopher T. Moss, Dublin; Timothy A. Tufts, Powell, both of Ohio, and Robert S. Bock, Hazelwood, Mo., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 30, 1988, Ser. No. 277,873

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—114 17 Claims

1. A method for curing a curable composition which comprises:

(a) formulating a lquid curable composition comprising an isocyanate-functional compound; and

(b) admixing said liquid curable composition with a catalyst system comprising an amino catalyst and an orthocarboxylic acid ester.

4,880,846

THERMOSET MOLDING COMPOSITIONS CATALYZED BY 1,4-BENZOQUINONE SALTS OF 1,8-DIAZA-BICYCLO(5.4.0)UNDEC-7-ENE

Timothy A. Tufts, Powell, Ohio; Robert S. Bock, Hazelwood, Mo., and Christopher T. Moss, Dublin, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 30, 1988, Ser. No. 277,884
Int. Cl.[4] C08G *18/20*
U.S. Cl. 521—129 10 Claims

1. In a process for the catalyzed reaction of a reaction mixture comprising an isocyanate and an active hydrogen compound, the improvement which comprises conducting said reaction in the presence of a catalyst comprising the salt of 1,8-diazo-bicyclo(5.4.0)undec-7-ene and 1,4-benzoquinone.

4,880,847

THERMOPLASTIC POLYURETHANE ENDOWED WITH IMPROVED CHARACTERISTICS OF RESISTANCE TO HEAT DISTORTION

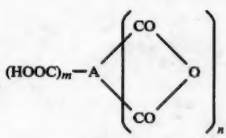
Lino Credali, Casalecchio Di Reno; Carlo Mulas, Mogliano Veneto; Ermanno Benetti, Mirano, and Gianflavio Lunardon, Padua, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Jul. 21, 1987, Ser. No. 75,965
Claims priority, application Italy, Jul. 23, 1986, 21208 A/86
Int. Cl.[4] C09B *29/22;* C08G *18/28*
U.S. Cl. 521—157 13 Claims

1. A process for the manufacture of a thermoplastic polyurethane showing an improved heat distortion resistance, consisting essentially of the following steps:

(a) reaction of an organic polyisocyanate, at 50°–250° C. and until the CO_2 release comes to an end, with at least one aromatic anhydride, optionally bearing carboxylic substitutive groups, and having the formula:

(I)



where A represents a substituted or unsubstituted aromatic radical containing from 6 to 20 carbon atoms, m is 0 or an integer from 1 to 3, and n is an integer equal to 1 or 2;

(b) addition to the above mixture, at 50° -150° C., of at least one polyol, reactive with said polyisocyanate and having a molecular weight higher than 400;

(c) addition of a chain extender having a molecular weight lower than 400; and

(d) pouring the homogenized mixture into a mold, where it is aged at a temperature higher than 150° C.

4,880,848

FOAM, COMPOSITION AND METHOD OF PRODUCTION, CONTAINING POLYURETHANE, POLYISOCYANURATE AND POLYUREA GROUPS

Ragui Ghali, 3400-14th Avenue, Markham, Ontario, Canada (L3R 2L6)

Filed Nov. 13, 1987, Ser. No. 119,923
Claims priority, application Canada, Nov. 14, 1986, 523060
Int. Cl.[4] C08G *18/00, 18/14;* C08J *9/00*
U.S. Cl. 521—174 15 Claims

1. In a process for preparing a semi-flexible, light-weight fire-retardant foam having a density in the range of 0.5 to 0.9 pounds per cubic foot by the reaction of polyether polyol and an organic polyisocyanate in the presence of water or disubstituted amine, a surfactant and a blowing agent, the improvement comprising adding to the foaming reactants an effective amount of catalysts for inhibiting polyurethane and polyurea formation while enhancing polyisocyanurate formation until completion of said polyisocyanurate formation to produce a ternary foam in which the reactant groups are present in the percentage of 10 to 35 per cent polyurethane, 30 to 35 per cent polyisocyanurate and to 20 to 45 per cent polyurea.

4,880,849

UV COATINGS CONTAINING CHLORINATED POLYOLEFINS, METHOD OF CURING, AND COATED SUBSTRATES THEREFROM

James E. Poole, Gibsonia, and Marvis E. Hartman, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 14, 1988, Ser. No. 168,069
Int. Cl.[4] C08C *19/28;* C08F *2/48*
U.S. Cl. 522—10 5 Claims

1. A coating composition which crosslinks upon exposure to ultraviolet radiation comprising:

(A) from 1 to 5 percent of a saturated, chlorinated polymeric material selected from the group consisting of (1) a chlorinated polyolefin containing about 5 to 75 percent by weight of chlorine and having a number average molecular weight of about 5,000–50,000, (2) a chlorinated polyolefin containing carboxylic anhydride groups and about 5 to 25 percent by weight of chlorine and having a number average molecular weight of about 5,000–50,000, and (3) a mixture thereof;

(B) from 20 to 80 percent of a radiation sensitive monomer having at least two addition polymerizable unsaturated bonds;

(C) from 0.1 to 5.0 percent of a photopolymerization initiator; and

(D) from 80 to 20 percent of an acrylic addition polymer having at least one amino group and having a number average molecular weight of about 8,000–70,000, said addition polymer being derived from a mixture of copolymerizable ethylenically unsaturated monomers containing a monomeric ethylenically unsaturated amine;

wherein said percentages of (A), (B), (C) and (D) are by weight based on nonvolatile components of said coating composition.

4,880,850

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Brasschaat, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 110,159, Oct. 16, 1987, abandoned, which is a division of Ser. No. 769,103, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Feb. 7, 1989, Ser. No. 309,050
Int. Cl.[4] C08J *3/28;* C08K *5/04;* C08L *69/00*
U.S. Cl. 522—79 35 Claims

1. A composition exposed to sterilizing radiation comprising an aromatic carbonate polymer in admixture with an amount of an alcohol stabilizing compound sufficient to inhibit yellowing of the composition upon said exposure, said alcohol being present in said composition in an amount of at most about 0.2 weight parts per 100 weight parts of said aromatic carbonate polymers.

4,880,851

AROMATIC COMPOSITION AND METHOD FOR THE PRODUCTION OF THE SAME

Tohru Yamamoto, c/o Nakato Laboratory, Inc., 6, Ohshinohara, Yasu-cho, Yasu-gun, Shiga-ken, Japan

Filed Feb. 26, 1988, Ser. No. 160,802

Claims priority, application Japan, Feb. 26, 1987, 62-43718; Feb. 27, 1987, 62-45462; Apr. 2, 1987, 62-82279

Int. Cl.[4] B01D *13/02*

U.S. Cl. 523—102 5 Claims

1. A method for the production of a composition having perfume substances encapsulated or clathrated in a matrix of polymer produced from alkoxides of metal, silicon or phosphorus, which method comprises the steps of:

adding an acid catalyst for sol-gel methods to an aqueous mixture of alkoxides of metal, silicon, or phosphorus, and perfume substances so as to cause the hydrolysis of said alkoxides; and

adding a base catalyst for sol-gel methods to the reaction mixture so as to cause the polycondensation of the hydrolysate to form a polymer, thereby said perfume substances being encapsulated or clathrated in the matrix of said polymer, wherein said base catalyst is selected from the group consisting of N,N-dimethylbenzylamine, tributylamine, tri-n-propylamine, tripentylamine, tripropargylamine, N,N,N-trimethylethylenediamine, and tri-n-hexylamine.

4,880,852

DEODORIZING POLYOLEFIN RESIN COMPOSITIONS AND FORMED DEODORIZING ARTICLES CONTAINING A MIXTURE OF A ZINC COMPOUND AND A SULFATE OF ALUMINUM

Akira Hoshino, Koshigaya; Mikio Saji, Kasukabe, and Isamu Yamaguchi, Souka, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Division of Ser. No. 928,377, Nov. 10, 1986. This application Apr. 25, 1988, Ser. No. 185,409

Claims priority, application Japan, Apr. 7, 1986, 61-078181; Apr. 7, 1986, 61-078182; Apr. 7, 1986, 61-078183; May 13, 1986, 61-107543

Int. Cl.[4] C08K *322, 9/12;* C11B *9/00;* A61K *7/00*

U.S. Cl. 523—102 6 Claims

1. A resin composition, comprising:

99.9–50 parts by weight of a thermoplastic polyolefin resin and 0.1–50 parts by weight of a combination of a zinc compound and a sulfate of aluminum, which combination functions as a deodorizing ingredient.

4,880,853

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Brasschaat, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 769,277, Aug. 26, 1985, abandoned, and a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Dec. 22, 1987, Ser. No. 136,607

Int. Cl.[4] C08K *5/07*

U.S. Cl. 523—136 7 Claims

1. A composition comprising an aromatic carbonate polymer in admixture with an amount of 2,4 pentanedione effective to inhibit yellowing upon exposure to sterilizing radiation.

4,880,854

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Roger W. Avakian, Brasschaat, Belgium, assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Dec. 22, 1987, Ser. No. 136,608

Int. Cl.[4] C08K *5/34, 5/13*

U.S. Cl. 523—136 8 Claims

1. An medical article sufficiently radiated to achieve sterilization, said article comprising an extruded admixture of (a) an aromatic carbonate polymer and (b) an effective amount of a stabilizing compound to inhibit yellowing upon sterilizing radiation exposure, where said compound is tetrakis(methylene(3,5-di-t-butyl-4-hydroxy-hydrocinnamate)methane.

4,880,855

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Brasschaat, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Dec. 22, 1987, Ser. No. 136,609

Int. Cl.[4] C08R *5/41*

U.S. Cl. 523—136 9 Claims

1. A composition comprising an aromatic carbonate polymer in admixture with an effective amount of a stabilizing sulfone ($-SO_2$) compound effective to inhibit yellowing upon exposure to sterilizing radiation, wherein said stabilizing sulfone compound has the general formula $R^5-SO_2-R^6$, R^5 and R^6 are the same or different, and R^5 and R^6 are selected from the group consisting of alkyl and aryl.

4,880,856

ENHANCING COLOR STABILITY OF STERILIZING RADIATION OF POLYMER COMPOSITIONS

Roger W. Avakian, Dalton, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 22, 1987, Ser. No. 136,602

Int. Cl.[4] C08K *5/34*

U.S. Cl. 123—136 14 Claims

1. A composition comprising an aromatic carbonate polymer in admixture with an effective amount of thiol stabilizing compound effective to inhibit yellowing upon exposure to sterilizing radiation, wherein said thiol stabilizing compound is 2.5-dimercapto-1,3,4-thiadiazole.

4,880,857

CARBON BLACK-GRAFT POLYMER, METHOD FOR PRODUCTION THEREOF, AND USE THEREOF

Yoshikuni Mori, Settsu; Mitsuo Kushino, Minoo; Hayato Ikeda, Settsu; Nobuaki Urashima, Takatsuki; Masuji Izubayashi, Nishinomiya; Shigeru Tanimori, Hirakata; Yoshihiro Arita, Takatsuki; Kiyoshi Kawamura, Mishima; Kenji Minami, Suita, and Yoshinori Sano, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 16, 1987, Ser. No. 134,319

Claims priority, application Japan, Dec. 17, 1986, 61-298985; Apr. 24, 1987, 62-99648; May 21, 1987, 62-122476; May 29, 1987, 62-131272; Jul. 8, 1987, 62-168868; Aug. 25, 1987, 62-209303; Sep. 3, 1987, 62-219097; Sep. 22, 1987, 62-236212; Sep. 22, 1987, 62-236214; Sep. 25, 1987, 62-238621

Int. Cl.[4] C08K *3/04;* C08F *292/00*

U.S. Cl. 523—205 10 Claims

1. A carbon black-graft polymer, produced by causing a polymer possessing within the molecular unit thereof at least one reactive group selected from an epoxy group, to react with the carbon black, wherein said polymer possesses one to two

reactive groups on the average and a number average molecular weight in the range of 2,000 to 100,000.

4,880,858

WATER ABSORBING POLYMERS

David Farrar, Bradford; Peter Flesher, Bingley; Malcolm Skinner; John Clarke, both of Bradford; David Marshall, North Mirfield, and Malcolm Hawe, Huddersfield, all of United Kingdom, assignors to Allied Colloids Limited, Bradford, England

Continuation-in-part of Ser. No. 835,602, Mar. 3, 1986, Pat. No. 4,690,971. This application Aug. 31, 1987, Ser. No. 91,551

Claims priority, application United Kingdom, Mar. 5, 1985, 8505632; Dec. 13, 1985, 8530784; Jan. 30, 1987, 8702052; Jul. 20, 1987, 8717093; Aug. 13, 1987, 8719215; Aug. 13, 1987, 8719216

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] C08J *0/00*

U.S. Cl. 524—60 17 Claims

1. A process comprising mixing a sticky mass of coal fines and water with polymer particles that are non-film forming and non-sticky when wet by the water in the sticky mass and that are a water absorbing polymer, and thereby forming a crumbly mixture of substantially dry coal fines and substantially non-sticky swollen polymer particles, wherein said water absorbing polymer is swellable but insoluble in water, said water absorbing polymer formed from a water soluble monoethylenically unsaturated monomer or monomer blend in the presence of a crosslinking agent.

4,880,859

LIGHT-STABILIZED STAR POLYMER MICROPARTICLES

Mario Slongo, Tafers; Jean Rody, Riehen; Franciszek Sitek, Therwil, all of Switzerland, and Andreas Valet, Eimeldingen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,741

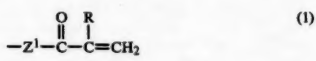
Claims priority, application Switzerland, Jun. 4, 1987, 2114/87

Int. Cl.[4] C08K *5/34, 5/13*

U.S. Cl. 524—91 29 Claims

1. Light-stabilized star polymer microparticles containing

(a) a polymer core of 1–100% by weight of one or more monomers which contain at least 2 groups of the formula



(1)

and 0–99% by weight of one or more monomers which contain one group of the formula (1), and

(b) at least 5 arms, fixed to the polymer core, of polymer chains consisting of one or more monomers which contain a group of the formula (1), R in the formula (1) being H, CH_3, CH_3CH_2, CN or COOR′, Z^1 being O or NR′ and R′ being C_1–C_4alkyl, at least 50% of the microparticles having at least 5 up to 2,000,000 such arms, these arms consisting of one or more groups of different polymer types, and

(α) the polymer chains of one of the said groups of arms having molecular weights which are the same as or different from those of the other groups, and being derived from the same monomers as the polymer chains of the other groups of arms, or from monomers differing from these,

(β) the polymer chains of each group of arms having an arm polydispersity of 1.0 to 2.0, this polydispersity being defined by the weight average divided by the number average of the polymer chains in the group, and

(γ) the star polymer microparticles themselves, which contain a core and arms consisting of one or more groups, having a polydispersity of 1.0 to 2.0, this polydispersity being defined by the weight average divided by the number average of the microparticles, which polymer microparticles contain 0.1 to 30% by weight, relative to the monomer employed, of one or more light stabilizers, at least a part of the polymerization of the monomers being carried out in the presence of the light stabilizer.

4,880,860

POLYESTER MOLDING COMPOSITION, PROCESS FOR ITS PREPARATION AND ITS USE

Erich Blöcker, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 49,117, May 13, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 237,669

Claims priority, application Fed. Rep. of Germany, May 15, 1986, 3616431

Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—94 17 Claims

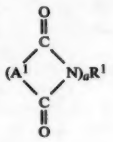
1. A polyester molding composition, comprising substantially

(A) a polyester of a reduced specific viscosity (measured at 25° C. in a 1% solution in dichloroacetic acid) of at least 0.3 dl/g,

(B) a nucleating agent in the form of an alkali metal compound

(C) a low-molecular organic compound as a crystallization accelerator in the presence or absence of

(D) reinforcing agents or other additives, wherein (C) is an organic imide compound which comprises one or more aromatic nuclei and is of the formula



(I)

in which A^1 is a substituted or unsubstituted divalent aromatic radical, R^1 is a branched or unbranched, unsubstituted or substituted aliphatic radical of valency a, having at least 5 carbon atoms and containing at least one —C(=O)—NH— group, and a is 1 or 2, which component (C) has a melting point below 200° C. and is present in a quantity sufficient to reduce the crystallization temperature of the molding composition by at least 4° C. as compared with that without (C).

4,880,861

COATING COMPOSITION

Shoichi Matsumura; Toshiro Nanbu, and Hisao Furukawa, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 124,237, Nov. 23, 1987, Pat. No. 4,826,904. This application Mar. 8, 1989, Ser. No. 320,646

Claims priority, application Japan, Nov. 25, 1986, 61-280469

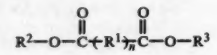
Int. Cl.[4] C08K *5/11*

U.S. Cl. 524—314 1 Claim

1. A coating composition comprising:

(a) 100 parts by weight of a hydrolyzable silyl group-containing vinyl polymer having on the main polymer chain end or a side chain thereof at least one silyl group containing a silicon atoms to which a hydrolyzable group is linked, per one polymer molecule, the main chain of said hydrolyzable silyl group-containing vinyl polymer consisting essentially of a polyester resin having a polymerizable unsaturated group; and

(b) 0.5 to 100 parts by weight of a dialkyl ester of a dibasic acid having the formula (1)



(1)

wherein R^1, is a bivalent group having 1 to 10 carbon atoms selected from the group consisting of alkylene, arylene and aralkylene, R^2 and R^3 are the same or different and each is an alkyl having 1 to 4 carbon atoms, and n is an integer of 1 to 10.

4,880,862

FLAME RETARDANT ABS RESIN COMPOSITION

Enrico J. Termine; Nicolai A. Faystritsky, both of Lafayette, and Dennis M. Borden, West Lafayette, all of Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Jun. 30, 1988, Ser. No. 213,538

Int. Cl.[4] C08K *5/06*

U.S. Cl. 524—373 **5 Claims**

1. A non-blooming flame retardant acrylonitrile-butadiene-styrene resin composition comprising:

a normally flammable acrylonitrile -butadienestyrene resin;

as a flame retardant agent, an effective amount of halogenated unsymmetricalhigher alkyl bisphenoxy alkane to render the composition flame retardant;

and

a flame retardant enhancing agent wherein the halogenated unsymmetrical higher alkyl bisphenoxy alkane is a compound of the structure: wherein X is bromine or chlorine; R_1 is straight or branched alkyl from C_1 to C_{12}; z is an integer from 2 to 5; n is 0, 1, or 2; R_2 is straight or branched alkyl selected from the groups consisting of sec-butyl (sec C_4H_9), pentyl (C_5H_{11}), hexyl (C_6H_{13}), hpetyl (C_7H_{15}), octyl (C_8H_{17}), nonyl (C_9H_{19}), decyl ($C_{10}H_{21}$), undecyl ($C_{11}H_{23}$) and dodecyl ($C_{12}H_{25}$); y is 0, 1, or 2; R_3 is straight or branched alkylene from C_1 to C_{12}; and such that if n is 1, R_1 is not R_2.

4,880,863

POLYMER BLEND

Robert G. Lutz, Santa Rosa, Calif., and Edgar J. Smutny, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

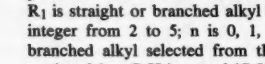
Filed Jun. 27, 1988, Ser. No. 211,626

Int. Cl.[4] C08L *71/02*; C08K *5/06*

U.S. Cl. 524—377 **8 Claims**

1. A composition comprising a non-miscible blend of, as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, as a minor component, a hydroxyl-terminated poly(alkylene oxide) polymer, wherein

(a) the linear alternating polymer consists essentially of recurring units represented by the formula



wherein G is the moiety of an ethylenically unsaturated hydrocarbon of 3 to 20 carbon atoms inclusive polymerized through the ethylenic unsaturation and the ratio of y:x is no more than about 0.5, and

(b) the hydroxyl-terminated poly(alkylene oxide) polymer is represented by the formula

wherein R is alkylene of from 2 to 6 carbon atoms inclusive and n is a number from about 4 to about 500.

4,880,864

THERMOPLASTIC POLYCARBONATES AND BLENDS WITH ENHANCED FLAME RETARDANT PROPERTIES

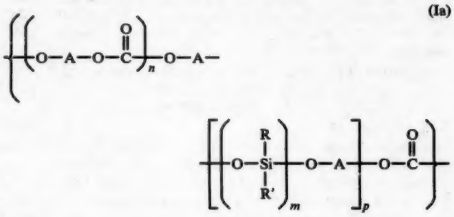
Winfried G. Paul; Ronald L. Price, and Sivaram Krishnan, all of Pittsburgh, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Dec. 29, 1987, Ser. No. 138,982

Int. Cl.[4] C08K *3/38*

U.S. Cl. 524—404 **10 Claims**

1. A thermoplastic molding composition consisting essentially of (1) a polydiorganosiloxane-polycarbonate block copolymer conforming structurally to



(Ia)

wherein

p is an integer of from 1 to about 10,

n is an integer of from 1 to about 1000,

m is an integer of from 1 to about 500,

A is a derivative of an aromatic dihydroxy compound,

R and R′ independently denote a C_1–C_{20} alkyl radical or a C_6–C_{14} aryl radical,

which copolymer is characterized in that its relative viscosity measured on a solution of 0.5 g in 100 ml ofdichloromethane at 25° C. is at least 1.15 and (ii) a positive amount of up to 2% by weight of a salt formed between an alkali metal or alkaline earth metal and an inorganic acid which contains a complex ion.

4,880,865

MICA AND GLASS REINFORCED POLYKETONE POLYMERS

Eric R. George, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 31, 1988, Ser. No. 238,386

Int. Cl.[4] C08L *75/00*

U.S. Cl. 524—449 **12 Claims**

1. A polymeric composition comprising a major amount of a linear alernating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and minor amounts, relative to the polymer, of glass fiber reinforcement and mica.

4,880,866

THERMOPLASTIC POLYESTER COMPOSITIONS CONTAINING CERTAIN LOW MOLECULAR WEIGHT DIEPOXIDE RESINS AND HAVING IMPROVED IMPACT BEHAVIOR

Donal McNally, Chatham; H. Leslie LaNieve, Warren, and Jerome L. Costanzo, Bridgewater, all of N.J., assignors to Hoechst Celanese, Somerville, N.J.

Continuation of Ser. No. 853,282, Apr. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 788,157, Oct. 16, 1985, abandoned, which is a continuation of Ser. No. 666,684, Oct. 31, 1984, abandoned. This application Jun. 17, 1987, Ser. No. 63,731

Int. Cl.[4] C08L *67/02, 69/00*

U.S. Cl. 524—504 **10 Claims**

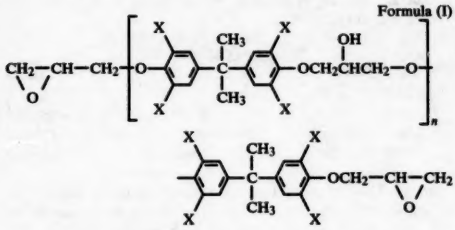
1. Thermoplastic polyester composition having improved impact strength comprising a blend of:

(a) at least about 60 weight percent polybutylene terepthalate having an intrinsic viscosity between about 0.4 and

about 1.3 dl/g as determined in orthochlorophenol at 25° C.

(b) between about 0.1 and about 8 weight % based on poly (C_2–C_4 alkylene terepthalate) of a diepoxide resin having a molecular weight between about 350 and about 2,100 and consisting essentially of at least one condensation product of bisphenol A or brominated bisphenol A and epihalohydrin and represented by the general formula (I):

Formula (I)



wherein X is bromine or hydrogen and n is an average number above zero and less than about 2.3;

(c) a catalytic amount of at least one catalyst selected from the group consisting of alkyl triphenyl phosphonium halides and alkenyl triphenyl phosphonium halides; and

(d) between about 5 and about 30 weight % based on poly (C_2–C_4 alkylene terephthalate) of a butadiene-based multiphase composite polymer having an elastomeric core of a polybutadiene or polybutadiene/styrene and a thermoplastic shell of polymethylmethacrylate.

4,880,867

AQUEOUS COATING COMPOSITIONS, A PROCESS FOR THEIR PREPARATION AND METHOD OF USING THE SAME

Armin Gobel, Wuppertal; Knut Graff, Hattingen; Hans-Ulrich Meier, Essen, and Hans-Peter Patzschke, Wuppertal, all of Fed. Rep. of Germany, assignors to 501 Herberts Gesellschaft mit Beschrankter, Wuppertal, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,905

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628125

Int. Cl.[4] C08L *75/00*

U.S. Cl. 524—507 **5 Claims**

1. An aqueous coating composition of a non-yellowing film forming material based on water dilutable polymeric binders comprising of a mixture of

(A) 90 to 40% by weight of a poly(meth)acrylate resin which contains hydroxyl groups, wherein said resin (A) has:

(a) a number average molecular weight (Mn) of from 10,000 to 500,000,

(b) a glass transition temperature of from −50° to +150° C.,

(c) an acid number of from 0 to 80 (mg KOH per g of solid resin),

(d) a hydroxyl number of from 60 to 250 (mg KOH per g of solid resin) and

(e) A viscosity of from 5 to 100 Pa.s (determined on a 50% solution in butoxyethanol at 25° C.), and

(B) 10 to 60% by weight of an anionic polyurethane resin dispersion, having an acid number of from 5 to 50 wherein: the quantitative percentage proportions of (A) and (B) are based on their solids content of which the sum amounts to 100%, and

(C) pigments.

4,880,868

EXTENDED SHELF LIFE WATER-ABSORBING COMPOSITION WHICH FACILITATES FIBER FORMATION

Bi Le-Khac, West Chester, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Division of Ser. No. 915,455, Oct. 6, 1986, Pat. No. 4,731,067. This application Dec. 17, 1987, Ser. No. 136,810

Int. Cl.[4] C08F *8/14, 22/06, 22/04, 20/06*

U.S. Cl. 524—549 **31 Claims**

1. A stable, heat curable aqueous composition comprising:

(a) a copolymer containing from about 25 to about 75 mole percent of about 20 to about 80 percent neutralized carboxylic acid substituted ethylenic units and from about 75 to about 25 mole percent recurring units of at least one copolymerizable comonomer; and

(b) at least one unreacted compound containing at least two hydroxyl groups, wherein the resulting aqueous composition is uncured and stable at room temperature.

4,880,869

β-AMINO-β-PROPIOLACTAM DERIVATIVE AND MOISTURE CURABLE POLYURETHANE COMPOSITION THEREOF

Masaaki Aoki, Zushi; Mayumi Tani, Yokohama; Masayuki Kamiyama, Yokohama, and Kiyotsugu Asai, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP88/00040, § 371 Date Sep. 14, 1988, § 102(e) Date Sep. 14, 1988, PCT Pub. No. WO88/05431, PCT Pub. Date Jul. 28, 1988

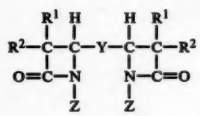
PCT Filed Jan. 21, 1988, Ser. No. 251,376

Claims priority, application Japan, Jan. 22, 1987, 62-11233; Mar. 13, 1987, 62-56936; Nov. 9, 1987, 62-281088; Dec. 23, 1987, 62-323822

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—773 **26 Claims**

1. A β-amino-β-propiolactam derivative having the formula (I):



(I)

wherein R^1 is a monovalent radical selected from the group consisting of a hydrogen atom, alkyl radical having 1–8 carbon atoms and cycloalkyl radical; R^2 is a monovalent radical selected from the group consisting of an alkyl radical having 1–12 carbon atoms and cycloalkyl radical; Y is a divalent radical obtained by eliminating a hydrogen atom respectively from each secondary amino group in an aliphatic or alicyclic di-secondary-amine having 1–22 carbon atoms; and Z is a monovalent radical obtained by eliminating an isocyanato radical from an aliphatic or aromatic monoisocyanate.

4,880,870

POLYMER GRANULATE, A PROCESS FOR ITS PREPARATION, AND ITS USE

Wolfgang Zimmermann, and Albrecht Harréus, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 534,943, Sep. 21, 1983, abandoned. This application Jul. 30, 1985, Ser. No. 762,746

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235189

Int. Cl.[4] B32B *5/16, 27/06, 27/08*; C08J *3/06*

U.S. Cl. 524—31 **27 Claims**

1. A polymer granulate which is useful for preparing adhesives or coatings and whose particles consist of a core compo-

nent and a coating component in a weight ratio of 50 to 98:50 to 2, wherein the core component is a water-soluble granular polyvinylalcohol, the coating component is more finely granular than the core component and is a member selected from the group consisting of boric acid, starch, a cellulose derivative, kaolin, silicon carbide and polyvinylalcohol, and the particles have diameters from 0.6 to 6 mm.

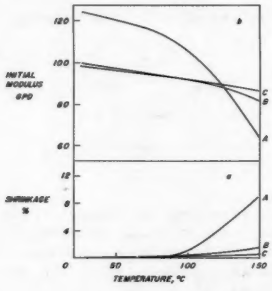
18. A process for preparing a polymer granulate, whose particles consist of from 50 to 98 per cent by weight of a core component and from 50 to 2 per cent by weight of a coating component, by mixing a granular polymer with a pulverulent substance at a temperature of from 15° to 30° C., which comprises coating granular water-soluble polyvinyl alcohol having particle diameters from 0.4 to 5 mm with a pulverulent substance having particle diameters from 0.01 to 1 mm in the presence of water in an amount of 10 to 20% by weight (based on the amount of water-soluble polyvinyl alcohol), the pulverulent substance being a member selected from the group consisting of boric acid, starch, a cellulose derivative, kaolin, silicon carbide and polyvinyl alcohol.

26. In a method which comprises preparing an adhesive or a coating from a polymer, the improvement wherein the polymer is a polymer granulate as claimed in claim 1.

4,880,871
FIBER FOR REINFORCING PLASTIC COMPOSITES AND REINFORCED PLASTIC COMPOSITES THEREFROM

David S. Cordova; David R. Coffin, both of Richmond; Stanley D. Lazarus, Petersburg, all of Va., and Steven A. Young, Cary, N.C., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 631,978, Jul. 18, 1984, Pat. No. 4,857,405. This application Dec. 21, 1987, Ser. No. 136,080
Int. Cl.[4] C08G *63/76;* C08F *8/00*
U.S. Cl. 525—43 9 Claims



1. A fiber reinforced plastic composite comprising: (a) a resin matrix; and (b) a high tenacity reinforcing fiber selected from the group consisting of polyester, aliphatic polyamide, and combinations thereof, and coated with a composition comprising an aqueous solution of carboxyl-terminated, oil-free alkyd resin which is the reaction product of at least one aliphatic glycol containing 2 to 12 carbons with a combination of aromatic di- or trifunctional carboxylic acids and, optionally, an unsaturated aliphatic carboxylic acid, said resin having a degree of esterification below the gel point of the resin, to enhance stiffness of the fiber for cutting; wherein the aliphatic glycol is selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, tetraethylene glycol, butane diol, butene diol, butyne diol, and combinations thereof; and wherein the aromatic carboxylic acid is selected from the group consisting of orthophthalic acid, orthophthalic anhydride, isophthalic acid, terephthalic acid, trimellitic acid, trimellitic anhydride, 2,6-naphthalene dicarboxylic acid, phenylindane dicarboxylic acid, trimesi acid, 4,4'-diphenyldicarboxylic acid, 2,6-pyridine dicarboxylic acid, p-hydroxymethyl benzoic acid, 5-tert-butyl isophthalic acid, bimesitylene-4,4'-dicarboxylic acid, and combinations thereof.

4,880,872
HEAT RESISTANT HIGH MODULUS REACTION INJECTION MOLDING (RIM) POLYMERS, BLENDS USED IN THE PRODUCTION THEREOF AND A PROCESS FOR PRODUCING THE SAME

Arthur K. Thomas, Woodbury, N.J., assignor to ICI Americas Inc., Wilmington, Del.

Filed Apr. 3, 1986, Ser. No. 847,490
Int. Cl.[4] C08L *67/06*
U.S. Cl. 525—43 5 Claims

1. A blend which comprises:

(a) at least 5% by weight of an ethylenically unsaturated component containing at least one ethylenically unsaturated monomer and at least one ethylenically unsaturated polymer;

(b) 30–75% by weight of a polyoxyalkylene polyamine of molecular weight between 190 to 3,000 wherein said polyamine is selected from the group consisting of:

(1) a diamine of the general formula $H_2NCH_2—CXH(OCH_2CHX)_yNH_2$ where X is H or an alkyl group having 1–18 carbon atoms and where y is a number from about 2 to about 16;

(2) a triamine of polyalkoxylated trimethylol propane of the general formula: $CH_3CH_2C[CH_2—CHX)_zNH_2]_3$ where X is H or an alkyl group having 1–8 carbon atoms and z is between 1 and 11, and

(3) $R[OCH_2CHX)_nOCHYCHZ\ NHA]_m$ where R is the nucleus of an oxyalkylation-susceptible aliphatic polyhydric alcohol containing 2–20 carbon atoms and 2–8 hydroxyl groups, A is hydrogen or a cyano-lower-alkyl radical having 1 or 2 carbon atoms optionally substituted with an alkyl group containing 1 to 8 carbon atoms between the nitrogen and cyano radical provided at least one A is a cyano-lower-alkyl radical, Z is an alkyl group containing 1–18 carbon atoms, X and Y are hydrogen or Z, n has an average value of 0–50 and m is 2–8, R is saturated and consists of carbon and hydrogen

(c) 5–40% by weight of a diamine chain extender selected from the group consisting of (i) C_1–C_{18} aliphatic diamines, (ii) C_6–C_{16} cycloaliphatic diamines, and (iii) an aromatic diamine having at least one lower alkyl substituent in the ortho position to each amine group.

4,880,873
ADHESIVE FOR CHLORINE-CONTAINING POLYMERS AND AROMATIC GROUP-CONTAINING POLYMERS

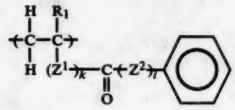
Toshihiro Sagane, Yamaguchi, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 784,250, Oct. 4, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 170,628
Claims priority, application Japan, Oct. 5, 1984, 59-207975
Int. Cl.[4] C08L *23/26, 23/28, 23/36;* C08F *8/00*
U.S. Cl. 525—61 2 Claims

1. An adhesive for joining together two polymers to form a laminated structure comprising (A) a first layer of polymer selected from the group consisting of a chlorine-containing polymer and an aromatic polymer, (B) a second layer selected from the group consisting of a chlorine-containing polymer, an aromatic polymer and a polyolefin with (C) an adhesive layer therebetween, said adhesive comprising a modified olefin polymer composed of

(a) a recurring monomer unit selected from the group consisting of ethylene and propylene, and

(b) a recurring monomer unit represented by following formula:



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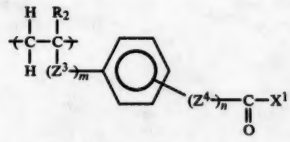
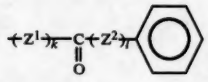


wherein R_1 and R_2 stand for a hydrogen atom or an alkyl group having up to 4 carbon atoms, each of k, l, m and n is 0 or 1, Z^1, Z^2, Z^3 and Z^4 stand for an oxygen atom or a divalent group comprising at least two elements selected from carbon, hydrogen, nitrogen and oxygen, X^1 stands for a monovalent group comprising at least two elements selected from carbon, hydrogen, nitrogen and oxygen or a blend of said modified olefin polymer with a polyolefin, wherein



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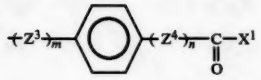
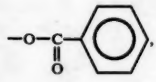
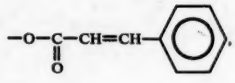
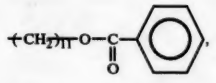
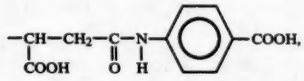


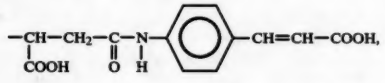
in said recurring monomer unit (b) is selected from the group consisting of











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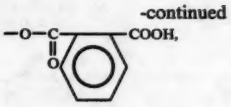


and is present at a concentration of 59 to 267 millimoles per 100 g of the polymer, and said polymer having an intrinsic viscosity (η) measured at 135° C. in decalin as a solvent of 0.7 to 4 dl/g.

4,880,874

RESIN OF POLYCARBONATE AND GRAFT COPOLYMER OF UNSATURATED EPOXY MONOMER AND ETHYLENE-α-OLEFIN BASE RUBBER

Mikio Hirai; Tokuo Tatsuda, and Tomio Yoshida, all of Niihama, Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

PCT No. PCT/JP88/00074, § 371 Date Sep. 7, 1988, § 102(e) Date Sep. 7, 1988, PCT Pub. No. WO88/05800, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 29, 1988, Ser. No. 246,817

Claims priority, application Japan, Jan. 29, 1987, 62-20037

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **2 Claims**

1. A resin composition comprising

(A) 10 to 99% by weight of a polycarbonate resin and

(B) 90 to 1% by weight of a resin which comprises

(b-1) 100 to 10% by weight of a copolymer which is obtainable by polymerizing 1 to 800 parts by weight of an unsaturated epoxy monomer and 0 to 2,000 parts by weight of other copolymerizable monomer in the presence of 100 parts by weight of an ethylene-α-olefin base rubber, and

(b-2) 0 to 90% by weight of a copolymer which is obtainable by polymerizing at least one monomer selected from the group consisting of aromatic vinyl compounds, cyanated vinyl compounds and alkyl unsaturated carboxylates.

4,880,875

THERMOPLASTIC MOLDING MATERIAL BASED ON POLYCARBONATE, ASA AND VINYLAROMATICS/AN-CONTAINING COPOLYMERS

Georg Wassmuth; Karl Ruppmich; Erhard Seiler, all of Ludwigshafen; Hermann Gausepohl, Mutterstadt, and Klaus Benker, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 28, 1987, Ser. No. 43,493

Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615607

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **6 Claims**

1. A thermoplastic molding composition consisting essentially of the following components:

A from 45 to 70% by weight of one or more polycarbonates,

B from 15 to 30% by weight of one or more graft copolymers,

C from 15 to 30% by weight of one or more thermoplastic copolymers containing one or more vinylaromatic monomers of 8 to 12 carbon atoms and acrylonitrile,

wherein component B is composed of

B_1 a first, coarsely divided graft copolymer which has an average particle size of from 200 to 700 nm (d_{50} value of cumulative molecular weight distribution) in a proportion of from 30 to 70% by weight, based on B, and

B2 a second, finely divided graft copolymer which has an average particle size of from 50 to 180 nm (d_{50} value of cumulative molecular weight distribution) in a proportion of from 70 to 30% by weight, based on B, wherein said first, coarsely divided graft copolymer B_1 is formed from

(b_1) one or more elastomers (rubbers) which account for from 40 to 80% by weight, based on (B_1), and are polymerized from a monomer mixture of

(b_1a_1) from 70 to 99.9% by weight, based on (b_1), of one or more alkyl acrylates where alkyl is of 1 to 8 carbon atoms

(b_1a_2) from 0 to 30% by weight, based on (b_1), of one or more further copolymerizable monoethylenically unsaturated monomers and

(b_1a_3) from 0.1 to 5% by weight, based on (b_1), of a copolymerizable polyfunctional crosslinking monomer, and

(b_2) a graft sheath on this elastomer, accounting for from 20 to 60% by weight, based on (B_1), and being based on

(b_2a_1) from 50 to 90% by weight, based on (b_2), of one or more monoethylenically unsaturated aromatic hydrocarbons of up to 12 carbon atoms and

(b_2a_2) from 10 to 50% by weight of one or more ethylenically unsaturated monomers copolymerizable therewith,

wherein said second, finely divided graft copolymer B_2 is formed from

(b_1) one or more elastomers (rubbers) which account for from 40 to 80% by weight, based on (B_2), and are polymerized from a monomer mixture of

(b_1a_1) from 70 to 99.9% by weight, based on (b_1), of one or more alkyl acrylates where alkyl is of 1 to 8 carbon atoms

(b_1a_2) from 0 to 30% by weight, based on (b_1), of one or more further copolymerizable monoethylenically unsaturated monomers and

(b_1a_3) from 0.1 to 5% by weight, based on (b_1), of a copolymerizable polyfunctional crosslinking monomer, and

(b_2) a graft sheath on this elastomer, accounting for from 20 to 60% by weight, based on (B_2), and being based on

(b_2a_1) from 50 to 90% by weight, based on (b_2), of one or more monoethylenically unsaturated aromatic hydrocarbons of up to 12 carbon atoms and

(b_2a_2) from 10 to 50% by weight of one or more ethylenically unsaturated monomers copolymerizable therewith.

4,880,876

THERMOPLASTIC POLYESTER MOLDING MATERIALS HAVING LOW-TEMPERATURE IMPACT STRENGTH

Hans-Henning Huh, Worms; Georg N. Simon, Limburgerhof; Gerhard Heinz, Weisenheim; Walter Ziegler, Edingen-Neckarhausen, and Juergen Sadlowski, Muenster-Hiltrup, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 94,023, Sep. 3, 1987, abandoned, which is a continuation of Ser. No. 875,573, Jun. 18, 1986, abandoned. This application May 2, 1988, Ser. No. 188,763

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3521957

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **7 Claims**

1. A thermoplastic polyester molding material which has low-temperature impact strength and essentially contains:

(A) from 20 to 79 parts by weight of one or more aliphatic polyesters of an aromatic dicarboxylic acid having a relative viscosity of from 1.2 to 1.8,

(B) from 20 to 79 parts by weight of one or more aromatic polycarbonates having a relative viscosity of from I.2 to 1.5,

(C) from 1 to 40 parts by weight of an elastomer blend consisting of I4

1. from 5 to 95% by weight of an ethylene copolymer composed of

(a) from 40 to 99% by weight of ethylene and

(b) from 1 to 60% by weight of one or more comonomers having a radical selected from the group consisting of carboxyl groups and derivatives of carboxyl groups and mixtures thereof, and

2. from 5 to 95% by weight of an elastomeric graft polymer which is prepared by emulsion polymerization and composed of

(a) from 70 to 95% by weight of a substantially crosslinked grafting base not less than 80% by weight of which consists of butadiene having a glass transition temperature T_g below −20° C. and

(b) from 5 to 30% by weight of a graft shell consisting of one or more polymers having a glass transition temperature T_g higher than 20° C., the amounts of components (A) to (C) summing to 100 parts by weight, and the amounts of components (1a) and (1b) and (2a) and (b) each summing to 100% by weight, wherein, in the graft rubber, not less than 80% of the particles have a diameter of from 0.05 to 0.2 μm.

4,880,877

METHOD FOR PRODUCING RUBBER MODIFIED THERMOPLASTIC RESINS

Teruhiko Sugimori, Otake; Noriyuki Tajiri, Toyohashi; Fumio Suzuki, Otake; Hideaki Habara, Otake; Yutaro Fukuda, Otake, and Haruki Sato, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,058

Claims priority, application Japan, Dec. 25, 1985, 60-295369; Dec. 26, 1985, 60-293952; Jul. 17, 1986, 61-166571; Jul. 28, 1986, 61-175508

Int. Cl.[4] C08L *51/04*

U.S. Cl. 525—84 **2 Claims**

1. A method for producing a rubber modified thermoplastic resin comprising graft rubber polymer (1) produced by emulsion graft polymerization of a vinyl monomer on a rubber latex, thermoplastic resin (2) and thermoplastic resin (3) which comprises carrying out successively the following steps:

(I) a step of mixing the following (A), (B), (C):

(A) a latex of graft rubber polymer (1),

(B) an organic agent which is capable of dissolving thermoplastic resin (2) added in step (II') and has a solubility in water of 5% by weight or less at a temperature at which (A), (B), (C) and thermoplastic resin (2) are mixed, the amount of the organic agent being 10–600% by weight of the sum of the graft rubber polymer (1), and thermoplastic resin (2),

(C) a water soluble agent capable of coagulating the latex (A), amount of this agent being 10% by weight or less of graft rubber polymer (1).

(II) a step of separating and removing an aqueous phase from a two-phase mixture obtained in the mixing step (I),

(II') a step of mixing thermoplastic resin (2) with the mixture obtained in step (II) from which the aqueous phase has been removed.

(III) a step of mixing the mixture obtained in step (II') with a part of thermoplastic resin (3),

(IV) a step of removing, by a thermal means, the whole or a part of the organic agent (B) and remaining water from the mixture obtained at step (III),

(V) a step of mixing the remainder of the thermoplastic resin (3) and

(VI) a step of removing the remainder of the organic agent (B) from the mixture obtained at step (V) when a part of the organic agent (B) has been removed at step (IV).

4,880,878

BLOCK COPOLYMER BLENDS WITH IMPROVED OIL ABSORPTION RESISTANCE

Glenn R. Himes, Houston, and Andrea Sanders, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1987, Ser. No. 138,780

Int. Cl.[4] C08L *53/02*

U.S. Cl. 525—89 **6 Claims**

1. A thermoplastic blend, comprising:

(a) about 80 to about 20 parts by weight of an elastomeric block copolymer having the general configuration A-B-A, wherein:

(i) each A block is a polymerized monoalkenyl aromatic

hydrocarbon block having an average molecular weight of about 4000 to about 115,000;

(ii) the A blocks, in combination, comprise about 5 to about 35w% of the elastomeric block copolymer; and

(iii) each B block is a non-hydrogenated butadiene hydrocarbon block consisting of 8 to 55 mole percent condensed butadiene units in the 1,2 configuration, or a hydrogenated butadiene hydrocarbon block consisting of 35 to 55 mole percent condensed butadiene units in the 1,2 configuration, and said B block has an average molecular weight of between about 20,000 and about 450,000; and

(b) about 20 to about 80 parts by weight of a block copolymer having the general configuration A-B-A wherein:

(i) each A block is a polymerized monoalkenyl aromatic hydrocarbon block having an average molecular weight of about 4000 to about 115,000;

(ii) said A blocks, in combination, comprise about 5 to about 35 w % of the block copolymer;

(iii) each B block is a polymerized butadiene hydrocarbon block consisting of about 18 to 34 mole percent condensed butadiene units in the 1,2 configuration, and said B block has an average molecular weight of between about 20,000 and about 450,000; and

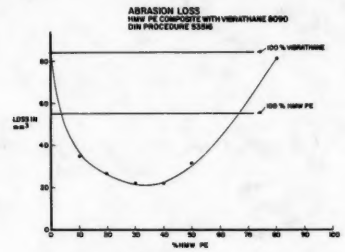
(iv) the B blocks are hydrogenated to an unsaturation that is less than about 5% of the original unsaturation.

4,880,879

ABRASION RESISTANT COMPOSITE MATERIAL AND PROCESS FOR MAKING THE SAME

Bernard D. Bauman, Coopersburg, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 18, 1988, Ser. No. 157,679
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—130 7 Claims



1. A composite material which can be easily molded into end products and which exhibits high abrasion resistance, comprising: a polyurethane material which has a surface tension of at least 40 dyne/cm at 20° C., into which has been dispersed high molecular weight polyethylene particles which have been surface treated to have a surface tension of at least 40 dyne/cm at 20° C., said particles comprising from 4 to 66 wt% of the composite material.

4,880,880

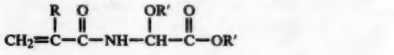
ADHESIVE TAPES INCLUDING SAME

Samuel J. Chen, Lexington, Mass., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 30,756, Mar. 25, 1987. This application Aug. 25, 1988, Ser. No. 236,426
Int. Cl.[4] C08F *18/22*
U.S. Cl. 525—163 11 Claims

1. An adhesive composition adapted for meeting Underwriters Laboratories specifications for metal foil adhesive tapes for use with rigid fiberglass air ducts, said composition comprising a copolymer of:

(1) an activated ester-containing vinyl monomer of the formula:



wherein R is hydrogen or methyl; and R′ is alkyl having one to six carbon atoms, or 2-hydroxyalkyl having having two to six carbon atoms;

(2) at least one ethylenically unsaturated carboxylic acid containing 3–5 carbon atoms;

(3) at least one acrylic or methacrylic acid ester of a non-tertiary alcohol having 1–14 carbon atoms and;

(4) at least one vinyl ester of a saturated carboxylic acid;

said polymer being crosslinked with a crosslinking agent reactive with the carboxylic acid moiety through its reactive hydrogen atom.

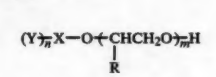
4,880,881

SIZING AGENTS FOR CARBON FIBERS

Hiroshi Minami, Aichi, Japan, assignor to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Filed May 19, 1988, Ser. No. 195,944
Claims priority, application Japan, Jun. 16, 1987, 61-149515
Int. Cl.[4] C08L *63/02;* C08K *3/04*
U.S. Cl. 525—438 8 Claims

1. A sizing agent for carbon fibers containing Component A, Component B and Component C as important constituents, Component A being an epoxy compound, Component B being a copolymer having within a molecule one oxyalkylene derivative of a polycyclic phenol segment and one or two monoester or polyester segments, said oxyalkylene derivative of a polycyclic phenol segment and monoester or polyester segments being connected through an ester linkage, said monoester or polyester segment of said Component B being obtained by alternately ring-opening addition reaction of organic dicarboxylic anhydride and 1,2-epoxide to oxyalkylene derivative of a polycyclic phenol in the presence of a catalyst, and Component C being oxyalkylene derivative of substituted phenol shown by the general formula



wherein Y is alkyl group, phenyl-methyl group or phenyl-ethyl group with 1–12 carbon atoms, X is benzene residue, diphenyl residue or cumylbenzene residue, R is hydrogen atom or methyl group, n is an integer in the range of 1–5 and m is an integer in the range of 4–100.

4,880,882

CURABLE RESIN COMPOSITION CONTAINING A MICROPARTICULATE SILICONE RUBBER

Yoshitsugu Morita; Noriyasu Yokoyama, and Keiji Yoshida, all of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,242
Claims priority, application Japan, Aug. 21, 1987, 62-207583
Int. Cl.[4] C08F *20/00*
U.S. Cl. 525—446 3 Claims

1. A curable resin composition comprising

(I) 100 parts by weight of a curable resin and

(II) 0.1 to 100 weight parts of spherical microparticulate silicone rubber obtained by curing an emulsified composition comprising

(A) 100 parts by weight of an organopolysiloxane having at least two silicon-bonded vinyl or allyl groups in each molecule,

(B) from 0.3 to 100 parts by weight of an organohydrogen-

polysiloxane having at least two silicon-bonded hydrogen atoms in each molecule, and

(C) from 0.1 to 50 parts by weight of an organic compound containing at least one epoxide group and at least one aliphatically unsaturated hydrocarbon group per molecule,

(D) an amount of a platinum-containing catalyst sufficient to promote curing of said organopolysiloxane,

where the continuous phase of said emulsion is water or a mixture of water and a surfactant, said emulsion is maintained at a temperature of from 0° to 25° C. prior to curing said composition, and said composition is cured by dispersing said emulsion into a liquid of gaseous medium maintained at a temperature above that of said emulsion.

4,880,883

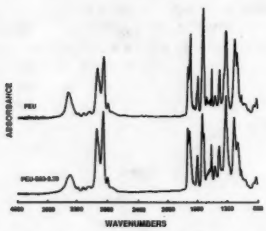
BIOCOMPATIBLE POLYURETHANES MODIFIED WITH LOWER ALKYL SULFONATE AND LOWER ALKYL CARBOXYLATE

Timothy G. Gruscl, and Stuart L. Cooper, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jun. 3, 1987, Ser. No. 57,546

Int. Cl.[4] C08F *283/04*; C08G *18/28, 18/70*

U.S. Cl. 525—454 **25 Claims**



1. A biocompatible, substantially solid polyurethane composition comprising a polyether-polyurethane copolymer based on a mole ratio of about 1.5/0.5/1.0 to about 10/9/1 of (a) an organic diisocyanate, (b) a C_2–C_{14} alkyl or aryl diol or diamine or hydroxy-functional amine and (c) a polyol having a number average molecular weight from about 500 to about 3000, respectively, the copolymer being modified wherein about 5 to about 25 percent of the urethane hydrogen atoms of the copolymer are replaced with a combination of lower alkyl (C_1–C_6) sulfonate groups and lower alkyl (C_1–C_6) carboxylate groups.

18. A method for the production of a modified and substantially solid polyether-polyurethane copolymer composition which is biocompatible and which provides improved physical and mechanical properties, said method comprising the steps of:

(a) providing a polyether-polyurethane copolymer based on a 3/2/1 mole ratio of an organic diisocyanate, a C_2–C_{14} alkyl or aryl diol or diamine and a polyol;

(b) modifying the copolymer by replacing up to about 25 percent of the urethane hydrogen atoms thereof with a combination of propyl sulfonate groups and propyl carboxylate groups in the presence of a solvent; and

(c) removing the solvent by drying the modified copolymer.

4,880,884

POLY(ARYL ETHER)-POLY(ARYL CARBONATE) BLOCK COPOLYMERS AND THEIR PREPARATION

Michael J. Mullins; Steven P. Crain; Edmund P. Woo, and Daniel J. Murray, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 27, 1988, Ser. No. 186,997

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—469 **12 Claims**

1. A block copolymer comprising:

poly(aryl ether) polymer segments and poly(aryl carbonate) polymer segments wherein at least some of the poly(aryl ether) segments are joined to the poly(aryl carbonate) segments through an ether oxygen atom, and wherein the aromatic radicals of the poly(aryl ether) segments include electron-withdrawing groups located in a position ortho or para to their respective linking groups linking one unit of the polymer chain to an adjacent unit.

4,880,885

POLYMERIZATION REACTOR PROVIDED WITH COATING THAT SUPPRESSES POLYMER DEPOSIT FORMATION

Willi Kleine, Burghausen; Werner Frey, Bergisch-Gladbach, and Albrecht Däweritz, Bad Aibling, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

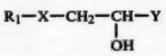
Continuation of Ser. No. 829,396, Feb. 13, 1986, abandoned, which is a division of Ser. No. 700,627, Feb. 12, 1985, Pat. No. 4,661,569. This application Apr. 15, 1988, Ser. No. 182,170

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405436

Int. Cl.[4] C08G *59/06*

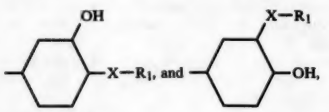
U.S. Cl. 526—62 **2 Claims**

1. A polymerization reactor provided with a coating on the inner wall of the reactor and other equipment whose surfaces come into contact with the constituents of the reaction mixture that at least suppresses polymer formation, the coating being comprised of at least one compound of the formula



wherein X is selected from the group consisting of —O—, —S—, and

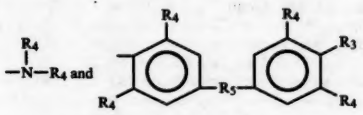
Y is selected from the group consisting of $—CH_2OR_6$



R_1 is selected from the group consisting of R_2—,

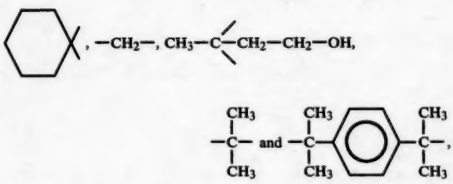
and R_2—SO_2—, R_2 is selected from the group consisting of phenyl optionally substituted with at least one R_3 and naphthyl optionally substituted with at least one R_3 or a heterocycle optionally substituted with at least one R_3 and derived by substitution of nitrogen, sulfur and/or oxygen atoms for at least one carbon of benzene, cyclopentadiene,

indene, naphthylene or their partially or completely hydrogenated analogs, an alkyl of 1 to 8 carbon atoms containing at least one R_3,

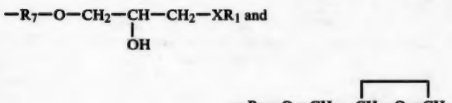


R_3 is selected from the group consisting of —OH, —SH,

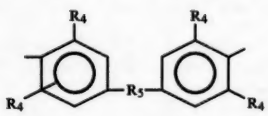
—COOH and $-SO_3H$, the R_4's being independently selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, R_5 is selected from the group consisting of



R_6 is selected from the group consisting of



and R_7 is selected from the group consisting of alkylene of 1 to 8 carbon atoms optionally substituted with at least one alkyl of 1 to 4 carbon atoms, phenylene having at least one R_3 and/or R_4, naphthylene having at least one R_3 and/or R_4 and



4,880,886

PROCESS FOR PRODUCTION OF HIGHLY WATER-ABSORBENT RESIN

Susumu Kondo, Kyoto; Tetsuo Moriya, Takatsuki, and Hiroshi Aoyama, Hirakata, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 27, 1988, Ser. No. 212,375

Claims priority, application Japan, Jul. 16, 1987, 62-177769

Int. Cl.[4] C08F *2/32*

U.S. Cl. 526—80 **5 Claims**

1. In a process for producing a highly waterabsorbent resin comprising subjecting a mixture of (meth)acrylic acid with a water-soluble salt thereof as a monomer to reversed phase suspension polymerization in a hydrophobic solvent in the presence of a dispersing agent, the improvement wherein at least a portion of said monomer is fed sequentially with the progress of the polymerization reaction and at least a portion of said dispersing agent is fed sequentially with the progress of polymerization, and

wherein the polymerization reaction is conducted under the following parameter settings:

Mi/Ma=0/100 to 20/80

Di/Da=0/100 to 40/60

D/M=1/100 to 6/100

Di/S=0/100 to 0.03/100

wherein M represents the total charge of monomer, Mi represents the initial charge of the monomer, Ma represents the additional charge of the monomer, D represents the total charge of the dispersing agent, Di represents the initial charge of the dispersing agent, Da represents the additional charge of the dispersing agent, and S represents the charge of the hydrophobic medium, all proportions being by weight.

4,880,887

METHOD FOR CURING DENTAL RESINS

Akira Hasegawa, Inuyama, Japan, assignor to G-C Toshi Kogyo Corporation, Kasugai, Japan

Filed Mar. 3, 1988, Ser. No. 163,791

Claims priority, application Japan, Mar. 6, 1987, 62-50295

Int. Cl.[4] C08L *33/04, 33/10*

U.S. Cl. 526—141 **6 Claims**

1. A method for curing a polymerizable dental compound, wherein the dental compound comprises a polymerizable material having at leas one ethylenically unsaturated double bond, comprising:

polymerizing said dental compound in the presence of

(1) N-cyclohexyl-5-ethylpyrimidinetrione in an amount of 0.1 to 10 parts by weight with respect to said dental compound,

(2) at least one organometallic compound selected from the group consisting of acetylacetone copper, copper acetate, copper oleate, acetylacetone manganese, manganese naphthenate, manganese octylate, acetylacetone cobalt (III), cobalt naphthenate, acetylacetone lithium, lithium acetate, cetylacetone zinc, zinc naphthenate, acetylacetone nickel, nickel acetate, acetylacetone aluminum, acetylacetone calcium, cetylacetone chromium (III), acetylacetone iron (III), sodium naphtheate and rare earth octoate in an amount of 0.001 to 0.2 parts by weight with respect to said dental compound and

(3) an organohalogen compound in an amount of 0.1 to 5 parts by weight with respect to said dental compound.

4,880,888

PROCESS FOR PRODUCING A WATER-ABSORBENT RESIN

Shigeji Obayashi, Akashi; Morio Nakamura, Kakogawa; Takushi Yamamoto, Himeji; Hitoshi Tanaka, Himeji, and Yuji Sakamoto, Himeji, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Japan

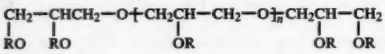
Filed Jan. 5, 1987, Ser. No. 238

Claims priority, application Japan, Jan. 25, 1986, 61-14307

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—209 **13 Claims**

1. A process for producing a water-absorbent resin wherein an aqueous solution containing an α,β-unsaturated carboxylic acid and an alkali metal salt thereof in a total amount of 25% by weight or more is subjected to polymerization with a radical polymerization initiator in a petroleum-based hydrocarbon solvent in the presence or absence of a crosslinking agent, characterized by using, as a surfactant, a polyglycerine—fatty acid ester having an HLB of 2 to 16 and represented by the general formula



(wherein R is an acyl group or hydrogen atom and n is an integer of 0 to 8).

4,880,889

HYDROXYLIC ACRYLATE COPOLYMER PROCESS FOR ITS PREPARATION, AND COATING AGENT BASED ON THE ACRYLATE

Werner Jung, Uhrwerkerstrasse 65, 4715 Ascheberg; Christoph Klesse, Eschkopfstrasse 4, 6703 Limburghof, and Axel Sievers, Tulpenweg 55-57, 4400 Münster, all of Fed. Rep. of Germany

Continuation of Ser. No. 813,276, Dec. 4, 1985, abandoned. This application Dec. 8, 1987, Ser. No. 134,576

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3412534

Int. Cl.[4] C05F *236/20*

U.S. Cl. 526—323 20 Claims

1. A hydroxylic acrylate copolymer comprising a precrosslinked, ungelled reaction product of

about 10 to about 60 percent of a hydroxyalkyl acrylate or methacrylate monomer (a^1) having from 2 to 14 carbons in the hydroxyalkyl group;

about 5 to about 20 percent of an unconjugated diolefinic monomer (a^2), the olefinic groups being at the two termini of the monomer;

about 15 to about 82% of a monoolefinic monomer (a^3) selected from the group consisting of styrene, vinyl toluene, acrylic acid, methacrylic acid and the alkyl, alkoxyethyl or aryloxyethyl ester of acrylic acid, methacrylic acid, maleic acid or fumaric acid;

wherein all percentages are by weight relative to the weight of the copolymer and said copolymer is dissolvable in a saturated organic ester solvent, produces a viscosity of about 0.4 to about 10 dPas when dissolved in an alkyl acetate solvent at a solids content of about 50 percent by weight, and exhibits no microgel content in solution.

4,880,890

ONE-CAN THERMOSETTING RESIN COMPOSITIONS AND PRECOATED METAL

Shigeaki Miyabayashi, Kobe; Yoshikatsu Matsuura, Minoo; Hiroshi Kanai, Kimitsu, and Joji Oka, Tokyo, all of Japan, assignors to Takeda Chemical Industries Ltd., Osaka and Nippon Steel Corporation, Tokyo, both of, Japan

Filed May 31, 1988, Ser. No. 200,377

Claims priority, application Japan, May 29, 1987, 62-137155

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[4] C08G *18/80*

U.S. Cl. 528—45 11 Claims

1. A one-can thermosetting resin composition comprising (A) a blocked product of hexamethylene diisocyanate or bis-(isocyanatomethyl)cyclohexane, or a blocked product of an adduct of hexamethylene diisocyanate or bis(isocyanatomethyl)cyclohexane and (B) a polyester polyol having at least three functional groups.

4,880,891

ONE-CAN THERMOSETTING RESIN COMPOSITIONS AND PRECOATED METAL

Shigeaki Miyabayashi, Kobe; Yoshikatsu Matsuura, Minoo; Hiroshi Kanai, Kimitsu, and Joji Oka, Tokyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka and Nippon Steel Corporation, Tokyo, both of, Japan

Filed May 31, 1988, Ser. No. 200,378

Claims priority, application Japan, May 29, 1987, 62-137156

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[4] C08G *18/80*

U.S. Cl. 528—45 10 Claims

1. A one-can thermosetting resin composition comprising (1) a polyester polyol obtained by allowing an aliphatic dicarboxylic acid to react with an aliphatic glycol and a polyol having at least three functional groups and (2) a blocked product of α,α,α′α′-tetra methyl-xylylene diisocyanate or 4, 4′-methylene bis(cyclohexyl isocyanate) or a blocked product of an NCO-terminated prepolymer obtained by allowing α,α,α′α′-tetramethyl-xylylene diisocyanate and/or 4,4′-methylene bis(cyclohexylisocyanate) to react with an active hydrogen compound.

4,880,892

COMPOSITION COMPRISING AN EPOXY RESIN, A PHENOL AND AN ADVANCEMENT CATALYST

Wataru Urano, Kawanishi, and Yasuaki Sugano, Takarazuka, both of Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 22, 1988, Ser. No. 234,779

Claims priority, application Japan, Aug. 31, 1987, 62-216991

Int. Cl.[4] C08G *59/68, 59/62*

U.S. Cl. 528—89 21 Claims

1. A composition which comprises

(a) an epoxy resin having on average more than one epoxy group per molecule,

(b) a mononuclear or polynuclear phenol having at least two phenolic hydroxyl groups per molecule and

(c) a small, but effective catalytic amount of a catalyst which is a combination of

(c1) a phosphonium halide or alkylene phosphorone and

(c2) a nitrogen heterocycle selected from the group consisting of

substituted or unsubstituted imidazoles, benzimidazoles, imidazolines, dihydropyrimidines, tetrahydropyrimidines, dihydroquinazolines, their salts and mixtures thereof.

4,880,893

NOVEL THERMOSETTING COMPOSITIONS AND MOLDING METHOD

Phillip A. Waitkus, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

Filed Dec. 28, 1988, Ser. No. 290,785

Int. Cl.[4] C08G *8/04, 14/02*

U.S. Cl. 528—129 10 Claims

1. A thermosetting resin composition useful in liquid injection molding processes comprises a high solids content phenolic resin and an effective amount of a polyglycol to improve clarity and to prevent voids in the cured product.

4,880,894

QUATERNARY AMMONIUM SALTS USED AS PHASE TRANSFER CATALYST

Carlos Sunkel; Miguel Fay de Casa Juana; Fernando Dorrego; Basilio Pando; Julio Alvarez-Builla; Juan J. Vaquero; Carlos Galera, and María L. Vazquez, all of Madrid, Spain, assignors to Alter, S.A., Madrid, Spain

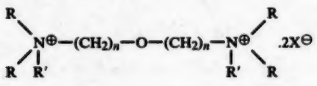
Continuation of Ser. No. 116,398, Nov. 3, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 251,032

Claims priority, application United Kingdom, Nov. 5, 1986, 8626438

Int. Cl.[4] C07D *277/60*

U.S. Cl. 548—152 7 Claims

1. A method for catalyzing heterogenous ionic reactions where the reaction reagents are in different phases and have different polarity comprising introducing quaternary ammonium salts of formula (I)



(I)

wherein;

R is a saturated or unsaturated, linear or branched alkyl radical of C_1 to C_8

R is a saturated or unsaturated, linear or branched alkyl radical of C_1 to C_12, or a benzyl radical

n is a number equal to 2 or 3

X^- is a halogenide anion, such as C_1^-, Br^-, I^-, into said reactions to catalyse said reactions.

4,880,895

POLYIMIDE FILM-FORMING POLYAMIDE ACID SOLUTION

Kazumi Higashi, and Yuzuru Noda, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 31, 1987, Ser. No. 32,643

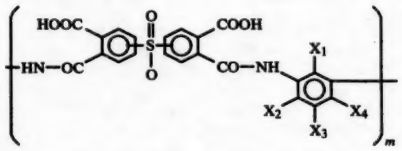
Claims priority, application Japan, Mar. 31, 1986, 61-76083

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

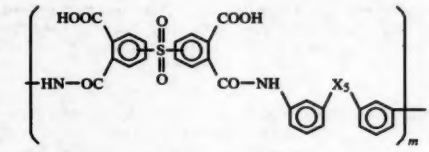
Int. Cl.[4] C08G *8/02*

U.S. Cl. 528—173 10 Claims

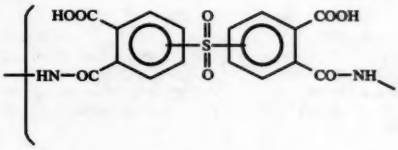
1. A polyamide acid solution comprising a polyamide acid comprising as main components at least one recurring unit selected from the group consisting of a recurring unit represented by formula (I)

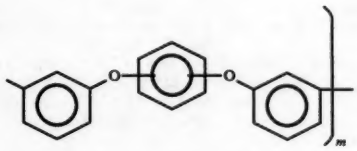


wherein X_1, X_2, X_3 and X_4, which may be the same or different, each represents H, CH_3, C_2H_5, NO_2, F, COOH or Cl; and m represents a positive integer; a recurring unit represented by formula (II)

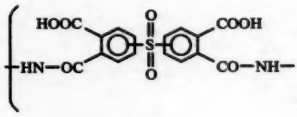


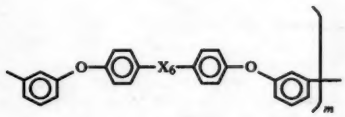
wherein X_5 represents O, SO_2, CH_2, S or CO; and m is the same as defined above; a recurring unit represented by formula (III)



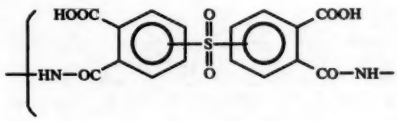


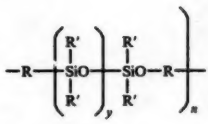
wherein m is the same as defined above; and a recurring unit represented by formula (IV)





wherein X_6 represents SO_2, $C(CH_3)_2$ or $C(CF_3)_2$; and m is the same as defined above, and a recurring unit represented by formula (V)





wherein R represents a divalent hydrocarbon group; R' repre-

sents a monovalent hydrocarbon group; y represents an integer of from 1 to 4; and n represents a positive integer selected so that n/(m+n) ranges from 0.01 to 0.05, dissolved in an organic solvent comprising as a main component an amide type polar solvent having a boiling point of 170° C. or less.

4,880,896

POLYCARBONATE FOR DISC SUBSTRATE HAVING LOW BISPHENOL CONTENT

Kazunari Otsubo; Motonobu Ezoe; Hideo Ago, and Koji Yamamoto, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 191,604

Claims priority, application Japan, May 30, 1987, 62-133524; Jun. 18, 1987, 62-150101; Jun. 30, 1987, 62-161325; Nov. 12, 1987, 62-284232

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—196 **6 Claims**

1. Polycarbonate for use in production of a disc substrate, having a low molecular weight polymer content of not more than 3% by weight, an unreacted bisphenol content of not more than 20 ppm, and a methylene chloride content of not more than 20 ppm.

4,880,897

PROCESS FOR PREPARING AROMATIC POLYCARBONATES

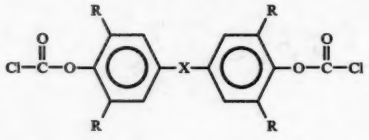
Thoi Ho, and Che-I Kao, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1988, Ser. No. 235,580

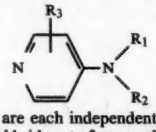
Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—199 **5 Claims**

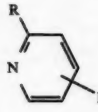
1. A process for the preparation of high molecular weight polycarbonates, comprising contacting under interfacial polycarbonate-forming conditions, a substituted aromatic bischloroformate corresponding to the general formula:



wherein X is a divalent C_1–C_{15} hydrocarbon radical, a single bond, —O—, —S—, —S—S—, —SO—, —SO_2— or 13 CO—, and each R is independently a halogen or C_1–C_4 alkyl radical, with an alkali metal hydroxide, in the presence of an activated pyridine selected from the group including 4-aminopyridines of the general formula:



wherein R_1 and R_2 are each independently monovalent alkyl radicals, alkyl radical bridges to form cycloalkylene groups, or polymer chains, and R_3 is independently hydrogen or a monovalent alkyl radical, or 2-substituted pyridines of the general formula:



wherein R is a monovalent alkyl radical, a cyloalkyl radical, or a polymer chain, and R_3 is as previously defined, in an amount effective to catalyz the formation of a polycarbonate.

4,880,898

WATER-SOLUBLE POLYCONDENSATES BASED ON FATTY ACIDS, DIALKANOLAMINE AND MALEIC ANHYDRIDE, A PROCESS FOR THEIR PRODUCTION, HYDRAULIC COMPOSITIONS CONTAINING THEM AND THEIR USE

Bernd Wahle, Kaarst; Hermann Anzinger; Horst Ziche, both of Duesseldorf, and Erhard Schinski, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 287,354

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3743413

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 **19 Claims**

1. A water-soluble polycondensate based on a C_8–C_{22} fatty acid, a dialkanolamine or alkoxylated derivative thereof and maleic anhydride, obtained by condensation of

(a) a dialkanolamide corresponding to formula I

$$R—CO—N(C_kH_{2k}—OH)_2 \quad (I)$$

in which R—CO— is the residue of a C_8—C_{22} fatty acid and k is the number 2 or 3, or a dialkanolaminopolyglycolate corresponding to formula II

$$R—CO—(O—C_mH_{2m})_n—N(C_kH_{2k}—OH)_2 \quad (II)$$

in which R—CO— and k are as defined above, m is the number 2 or 3 and n is a number of 1 to 10, or a dialkanolammonium alkyl polyglycolate corresponding to formula III

$$R—CO—(O—C_mH_{2m})_n—N^+C_kH_{2k}\text{-}OH)_2R^1\,X^- \quad (III)$$

in which

R—CO—, k, m and n are as defined above,

R^1 is a C_1–C_4 alkyl group and

X^- is the residue of an alkylating agent,

with maleic anhydride in a molar ratio of from 1:0.5 to 1:2, to form a condensation product having an acid value of up to about 20, and

(b) reaction of substantially all the olefinic double bonds of the condensation product in the α-position to carboxyl groups with a sulfite.

4,880,899

CYCLIC POLYPHENYLENE ETHER-POLYCARBONATE OLIGOMERS

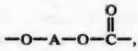
Thomas L. Guggenheim, Scotia, N.Y., and Joseph W. Guiles, Ft. Collins, Colo., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 26,517, Mar. 17, 1987, Pat. No. 4,789,725. This application Mar. 7, 1988, Ser. No. 164,935

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—370 **13 Claims**

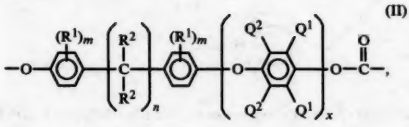
1. A composition comprising cyclic oligomers containing at least one moiety of the formula



(I)

in combination with at least one moiety of the formula

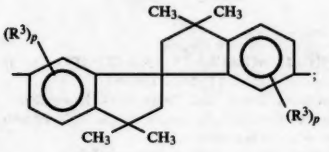
(II)



wherein:

A is a divalent spirobiindane radical of the formula

(III)



each Q^1 is independently halogen, primary or secondary lower alkyl, phenyl or hydrocarbonoxy;

each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl or hydrocarbonoxy;

each R^1 is independently C_{1-8} primary or secondary alkyl, phenyl or halo;

each R^2 is independently hydrogen, methyl, ethyl or phenyl;

each R^3 is independently C_{1-4} primary or secondary alkyl or halo;

m is from 0 to 4;

n is 0 or 1;

p is from 0 to 3; and

x is from 1 to about 5.

4,880,900

CARBON MONOXIDE/OLEFIN POLYMERIZATION PROCESS WITH BIS (DIARYL PHOSPHINO) 2-SILAPROPANE CONTAINING CATALYST

Johannes A. van Doorn; Johannes J. M. Snel; Nicolaas Meijboom, and Richard L. Wife, all of Amsterdmn, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 22, 1988, Ser. No. 222,993

Claims priority, application Netherlands, Jul. 23, 1987, 8701741

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **13 Claims**

1. In the process of producing linear alternating polymers of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, by contacting the carbon monoxide and unsaturated hydrocarbon under polymerization conditions in the presence of a catalyst composition formed from a palladium salt, the anion of a non-hydrohalogenic acid having a pKa below about 6, and a phosphine ligand, the improvement wherein the phosphine ligand comprises a 1,3-bis(phosphino)-2-silapropane wherein the 2-silapropane moiety is substituted with two hydrocarbyl substituents at the silicon atom.

4,880,901

ARYLENE SULFIDE TERPOLYMERS AND PROCESSES FOR MAKING THEM

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 786,901, Oct. 11, 1985, abandoned, which is a continuation of Ser. No. 404,683, Aug. 3, 1982, abandoned. This application May 30, 1986, Ser. No. 870,652

Int. Cl.[4] C08G *75/14*

U.S. Cl. 528—388 **17 Claims**

1. A process comprising the steps:

(a) contacting components consisting of at least one alkali metal sulfide, at least one p-dihalo unsubstituted benzene, at least one polyhalo aromatic compound having more than two halogen substituents per molecule, about 15 to aabout 20 mole percent of at least one p-dihalo alkyl substituted benzene, and at least one N-alkyl lactam, under polymerization conditions for a time effective to produce an amorphous arylene sulfide polymer; and

(b) recovering said amorphous arylene sulfide polymer, wherein said amorphous arylene sulfide polymer has essentially no melting point (T_m) and essentially no crystallization temperature (T_c).

4,880,902

COPOLYMERIZATION OF CARBON MONOXIDE AND OLEFIN WITH DIPHOSPHINE HAVING HETEROCYCLIC SUBSTITUENTS AS CATALYST

Johannes A. van Doorn; Richard L. Wife, and Petrus H. M. Budzelaar, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

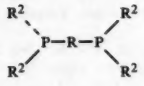
Filed Aug. 19, 1988, Ser. No. 233,793

Claims priority, application Netherlands, Aug. 27, 1987, 8702003

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **10 Claims**

1. An improved process for preparing polymers, wherein carbon monoxide is polymerized with olefinically unsaturated compounds in the presence of a palladium catalyst composition comprising a palladium compound, anions of an acid having a pKa less that about 6, and a diphosphine ligand, the improvement wherein the diphosphine ligand is of the general formula



wherein each R^2 is independently a similar or different carbocyclic hydrocarbon group, or a similar or different heterocyclic substituent selected from 2-pyridyl, 2-furyl or 2-thienyl groups, which substituent is bound to the phosphorus atom by one of the carbon atoms in the ring of the substituent, at least one R^2 being the heterocyclic substituent, and wherein R represents a bivalent bridging group containing at least one carbon atom in the bridge.

4,880,903

POLYKETONE FROM CARBON MONOXIDE AND MIXTURE OF OLEFINS

Johannes A. M. Van Broekhoven; Eit Drent; Ebel Klei, all of Amsterdam, Netherlands, and Kenzie Nozaki, El Cerrito, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 190,607, May 5, 1988, which is a continuation of Ser. No. 901,917, Aug. 28, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 228,429

Claims priority, application Netherlands, Aug. 29, 1985, 8502372

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **14 Claims**

1. A linear polymer consisting essentially of an average of n units with the formula —CO—(C_2H_4)— and an average of m units with the general formula —CO—(C_xH_y)— wherein the units are randomly distributed in the polymer, the quotient m/n is between about 0.33 and about 0.007, x is greater than 2 and less than 20, y is 2x, and the polymer has a melting point between about 150° C. and 245° C.

4,880,904

POLYKETONE-BASED STRUCTURAL ADHESIVE

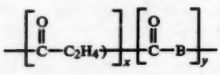
Peter A. Kinneberg, Houston, Tex.; Thomas A. Armer, Westboro, Mass.; Adriaan W. van Breen, Amsterdam, Netherlands; Roger E. C. Barton, Amsterdam, Netherlands, and Ebel Klei, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 128,952

Int. Cl.[4] C08G 67/02

U.S. Cl. 528—392 **5 Claims**

1. A structural adhesive consisting essentially of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, said polymer consisting essentially of recurring units represented by the formula



wherein B is the moiety of an ethylenically unsaturated α-olefin of at least 3 carbon atoms polymerized through the ethylenic unsaturation, and the ratio of y:x is no more than about 0.5.

4,880,905

PROCESS FOR PRODUCING ORGANOPHOSPHAZENE POLYMERS WITH CHLOROPHOSPHAZENE

Shinichiro Ueyama; Yasuhiro Yoshikawa, and Tetsuhiko Okamoto, all of Tokyo, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,008

Claims priority, application Japan, Nov. 19, 1987, 62-290712

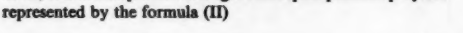
Int. Cl.[4] C08G 73/00, 25/00

U.S. Cl. 528—399 **7 Claims**

1. A process for producing an organophosphazene polymer represented by the formula (I)

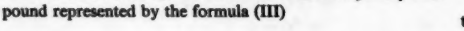
(I)

wherein R is the same or different group selected from the group consisting of alkyl, alkenyl, alkinyl and aryl group or said group having a substituent and n is an integer of 20 or more, which comprises reacting a chlorophosphazene polymer represented by the formula (II)



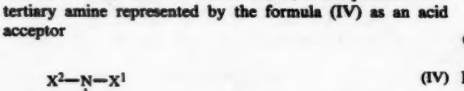
(II)

wherein n is an integer of 20 or more, x+y=2 and R is the same as defined above, with at least one kind of hydroxy compound represented by the formula (III)



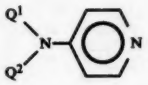
(III)

wherein R is the same as defined above, in the presence of a tertiary amine represented by the formula (IV) as an acid acceptor



(IV)

wherein X^1 represents alkyl, cycloalkyl or aralkyl, X^2 and X^3 represent identical or different lower alkyl or constitute pyrrolidine, piperidine or morpholine ring together with the nitrogen atom, and in the presence of a pyridine derivative represented by the formula (V) as a catalyst



(V)

wherein Q^1 and Q^2 represent identical or different lower alkyl groups or constitute a pyrrolidine, piperidine or morpholine ring together with the nitrogen atom to substitute substantially all the chlorine atoms with the —OR groups.

4,880,906

FIBER FINISHING AGENTS AND COMPOSITIONS CONTAINING THEM

Eberhard Esselborn, Essen, and Jürgen Fock, Duesseldorf, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,715

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723349

Int. Cl.[4] C08G 59/02

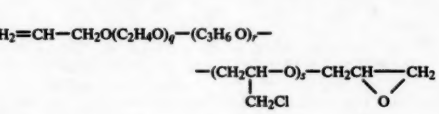
U.S. Cl. 528—403 **13 Claims**

1. A finishing agent for finishing fibers or fiber products comprising a mixture of the following components:

(a) 34 to 99% by weight of a polymer of the general formula wherein R^1 is a z-hydric aliphatic alcohol with z=2 to 9, m=20 to 75, n=0 to 10, p=0 to 3;

(b) 0 to 55% by weight of a copolymer, obtained by copolymerization of

(b_1) one mole of a macromonomer of the general formula



wherein q=5 to 75, r=0 to 10, s=0 to 3, with

(b_2) 2 to 12 moles of a vinyl ester of the general formula CH_2=CHOCOR^2, in which R^2 is alkyl with 1 to 4 carbon atoms,

(b_3) 1 to 6 moles of N-vinylpyrrolidone, and

(b_4) 0 to 6 moles of an acrylate or methacrylate ester of the general formula CH_3=CR^3—COOR^4, wherein R^3=H or CH_3, R^4 is alkyl with 1 to 4 carbon atoms, with the proviso that the quotient of the average molecular weight of the monomer (b_1) and the number of moles of the monomers (b_2), (b_3) and (b_4) is 20 to 500;

(c) 1 to 35% by weight of a compound, which is reactive with respect to oxiran groups and causes a cross linking reaction

the sum of the components (a), (b) and (c) yielding 100% by weight.

4,880,907

QUATERNARY SALTS OF QUINOLINE OLIGOMER AS METAL SURFACE PROTECTIVE MATERIALS (C-2212)

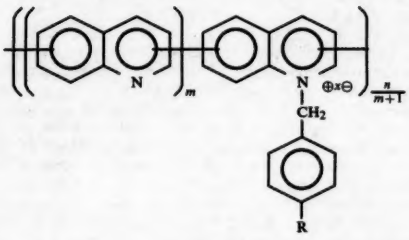
Long Y. Chiang, Somerset, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

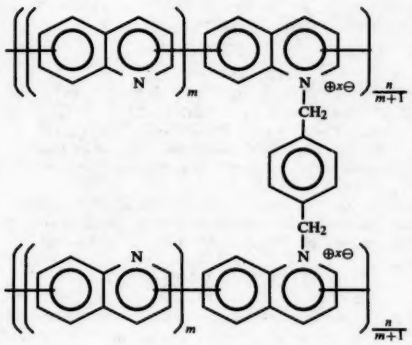
Continuation-in-part of Ser. No. 887,364, Jul. 17, 1986, Pat. No. 4,727,185. This application Feb. 12, 1988, Ser. No. 155,225

Int. Cl.[4] C08G 73/06

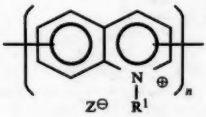
U.S. Cl. 528—423 **14 Claims**

1. A composition of matter comprising a quaternized derivative of a quinoline oligomer, said derivative selected from compositions having the formula:





or



wherein n and m are integers, with n being greater than 2 and up to about 200 and m being equal to or greater than 1, R is H or an alkyl group having from 1 to about 20 carbon atoms, R^1 is an alkyl group having 1 to about 20 carbon atoms, X^- is a chloride, bromide or iodide and Z^- is an anion selected from BF_4^-, $SO_4=$, ClO_4^-, PF_6^- or HSO_4^-

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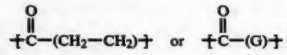
4,880,908

POLYMER BLEND OF CARBON MONOXIDE/OLEFIN COPOLYMER AND POLYCARBONATE

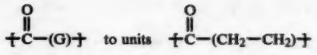
Robert G. Lutz, Santa Rosa, Calif., and William P. Gergen, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 11, 1988, Ser. No. 179,682
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—468 **16 Claims**

1. A polymeric composition comprising a blend of a linear alternating polymer having recurring units



wherein G is the moiety of an ethylenically unsaturated hydrocarbon of at least three carbon atoms and the ratio of units



is no more than about 0.5 with a polycarbonate.

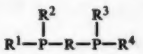
4,880,909

REMOVAL OF CATALYST RESIDUES FROM CARBON MONOXIDE/OLEFIN POLYMERS WITH OXIDANT/PHOSPHINE TREATMENT

Johannes A. M. Van Broekhoven, and Michael J. Doyle, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 935,429, Nov. 26, 1986, Pat. No. 4,786,716. This application Sep. 6, 1988, Ser. No. 240,338
Claims priority, application Netherlands, Nov. 26, 1985, 8503258
Int. Cl.[4] C08G *67/02*
U.S. Cl. 528—487 **12 Claims**

1. A process for reducing catalyst residues from a palladium compound catalyst-containing polymer of carbon monoxide and ethylene with or without at least one other olefinically unsaturated hydrocarbon having the general formula $CHR_1{=}CHR_2$, where R_1 is a hydrocarbon group and R_2 is selected from the group consisting of hydrogen and a hydrocarbon group, and where R_1 and R_2 together contain fewer than 18 carbon atoms, and regenerating a palladium compound catalyst for the preparation of said polymers, which process comprises contacting the polymer in an organic liquid with an effective amount for reducing catalyst residues of a phosphine having the general formula



wherein R^1, R^2, R^3 and R^4 represent hydrocarbon groups or such groups containing polar or non-polar substituents and R represents a bivalent organic bridging group containing at least two carbon atoms in the bridge, recovering a palladium compound-containing organic liquid, contacting said organic liquid with an oxidant selected from the group consisting of peroxides, hydroperoxides and oxygen, and recycling the thus contacted organic liquid to a process for preparing a polymer of carbon monoxide and ethylene with or without at least one olefinically unsaturated hydrocarbon.

4,880,910

TERMINAL METHIONYL BOVINE GROWTH HORMONE AND ITS USE

Herman A. de Boer, Pacifica; Herbert L. Heynerer, Burlingame, and Peter H. Seeburg, San Francisco, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 303,687, Sep. 18, 1981, abandoned. This application Jun. 8, 1984, Ser. No. 618,616
Int. Cl.[4] C07K *7/10*
U.S. Cl. 530—350 **2 Claims**

1. An N-terminal methionyl-BGH wherein the proximal twenty five amino acids of bovine growth hormone has the following sequence:

Met-Phe-Pro-Ala-Met-Ser-Leu-Ser-Gly-Leu-Phe-Ala-Asn-Ala-Val-Leu-Arg-Ala-Gln-His-Leu-His-Gln-Leu-Ala.

4,880,911

FUSED POLYPEPTIDES AND METHODS FOR THEIR DETECTION

Stephen J. Brewer, High Wycombe, and Helmut M. Sassenfeld, Benson, both of England, assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 471,917, Mar. 3, 1983, Pat. No. 4,532,207. This application May 9, 1985, Ser. No. 732,106

Int. Cl.[4] C07K *15/26, 15/00*

U.S. Cl. 530—351 3 Claims

1. A fused-polypeptide comprising urogastrone covalently bonded at its carboxy-terminus to a second polypeptide comprising $(arginine)_n$ wherein n is 2 to 30.

3. A fused-polypeptide comprising human gamma interferon covalently bonded at its carboxy terminus to a second polypeptide comprising

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4,880,912

DISPERSION AND NEUTRALIZATION OF ACID CASEIN

Oscar H. Callison, Pickerington, Ohio, assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 24, 1987, Ser. No. 42,394

Int. Cl.[4] C07G *7/00*

U.S. Cl. 530—361 15 Claims

1. A process for preparing caseinate from an acid casein comprising:

(a) providing an aqueous medium having a pH of between 7 and 8, and heating and maintaining said aqueous medium at a temperature of about 115° to about 170° F.;

(b) providing a solubilizing agent selected from the group consisting of alkali and alkaline metal citrates and mixtures thereof;

(c) adding said solubilizing agent to said aqueous medium and maintaining the temperature thereof in the range of about 115° to about 170° F.;

(d) agitating the aqueous medium containing said solubilizing agent, adding acid casein to said agitated medium and permitting the acid casein to age from about 10 to about 120 seconds;

(e) adding a neutralizing agent to said aged acid casein aqueous medium and neutralizing said aged acid casein aqueous medium for about 2 to about 30 minutes; and

(f) recovering the desired liquid or powdered caseinate.

4,880,913

PROCESS FOR THE PREPARATION OF AN IMMUNOGLOBULIN WHICH CAN BE ADMINISTERED INTRAVENOUSLY AND IS STABLE IN LIQUID FORM

Walter Doleschel; Walter N. Doleschel, and Werner Conrad, all of Vienna, Austria, assignors to Schwab & Co. Ges.m.b.H., Vienna, Austria

Filed Dec. 2, 1987, Ser. No. 127,914

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641115

Int. Cl.[4] A61K *39/395;* C07K *15/06, 15/14*

U.S. Cl. 530—387 8 Claims

1. A process for the preparation of a chemically unmodified, functionally and structurally intact immunoglobulin which has not been enzymatically treated, has no side effects, contains all IgG subclasses, is essentially free of IgA, is stable on storage in liquid form and can be administered intravenously, and which has a monomer content of above 97% and a content of trimers and higher polymers of below 1%, by subjecting a starting fraction having an IgG content between 30 and 100% to purification and concentration by the steps dialysis, adsorption and precipitation, which comprises

(a) dialysis of an aqueous solution of the starting fraction to remove low molecular weight constitutents, lowering the ionic strength at a pH of 6.0–9.0 by diluting the mixture with demineralized water and setting up a sodium chloride concentration of 1 mmol/l in order to remove euglobulins, removal of impurities from the supernatant from the euglobulin precipitation by adsorption once or twice on an anion exchanger in an amount of 5–50 mg/g protein at a pH of 6.0 to 9.0,

(b) stabilization of the solution by acid treatment at pH 2.5–4.2, heating at 40–60° C. and pH 3.0–8.0 for 15 to 20 minutes, returning the pH to 7.0–9.0, and removal of the insoluble fractions by centrifugation,

(c) removal of IgA and other impurities which are still present by treatment once or twice with an anion exchanger in an amount of 5–50 mg/g protein at pH 6.0–9.0,

(d) precipitation of labile and aggregated IgG molecules by addition of polyethylene glycol having a mean molecular weight of 200–1,000 to a final concentration of 10–25% (w/w) and removal thereof by centrifugation, removal of the precipitant, by dialysis or ultrafiltration, adjustment of the solution to the desired protein concentration, and sterilization thereof by filtration.

4,880,914

ASSAY FOR QUALITATIVELY AND/OR QUANTITATIVELY MEASURING HLH OR HCG IN BODY FLUIDS AND REAGENTS THEREFOR

Brij B. Saxena, Englewood, and Premila Rathnam, Englewood Cliffs, both of N.J., assignors to Cornell Research Foundation, Inc.

Division of Ser. No. 440,477, Nov. 9, 1982, Pat. No. 4,560,649, which is a continuation-in-part of Ser. No. 311,736, Oct. 15, 1981, abandoned. This application Sep. 23, 1985, Ser. No. 778,933

Int. Cl.[4] C07K *3/02, 3/14, 3/20, 3/28*

U.S. Cl. 530—395 33 Claims

1. A method for purifying a naturally-occuring gonadotropin receptor material containing the common receptor for hLH and hCG which comprises:

A. Homogenizing a receptor source material in an aqueous medium to disperse the receptor in a liquid aqueous fraction;

B. Separating and concentrating the liquid fraction;

C. Fractionating the concentrate to separate at least one of inactive protein and lipid from the receptor;

D. Re-dispersing the receptor in aqueous medium and extracting the aqueous medium with an organic solvent in which lipids are soluble to remove additional lipid from the aqueous phase;

E. Separating the aqueous phase from the remainder of the product of step D;

F. Separating hLH and hCG specific binding fraction of the receptor from adenyl cyclase and 5'-nucleotidase activity fractions of the receptor;

G. Subjecting the hLH and hCG specific binding fraction of the receptor to vertical zone electrophoresis to separate said fraction from other remaining protein fractions and

H. Recovering the resultant purified receptor.

4,880,915

METHOD FOR PURIFYING A PHYSIOLOGICALLY ACTIVE SUBSTANCE PRODUCED BY RECOMBINANT DNA TECHNIQUE

Junichi Kajihara; Takao Kiyota, and Hiroshi Hayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,509

Claims priority, application Japan, Nov. 22, 1984, 59-246184

Int. Cl.[4] C12P *21/00, 21/02;* C07K *13/00*

U.S. Cl. 530—413 4 Claims

1. A method for purifying a human TNF which comprises: applying an aqueous solution containing human TNF to a column packed with a dye-bonded crosslinked agarose gel comprised of a crosslinked agarose gel support and a dye ligand covalently bonded thereto, said dye being a member selected from the group consisting of Cibacron Blue F3GA (color index name: reactive blue 2), Procion Red

HE3B (color index name: reactive red 120), and Green A, whereby said human TNF is retained by said gel;

eluting said column with an eluent to release said human TNF from said gel; and

recovering a column fraction comprised of purified human TNF.

4,880,916
CATIONIC AZO DYES CONTAINING 2(P-AMINOPHENYL)OXAZOLO [4,5-B]PYRIDINES AND SIMILAR COMPOUNDS AS DIAZO COMPONENTS

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

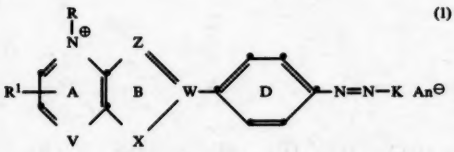
Filed Mar. 24, 1988, Ser. No. 172,684

Claims priority, application Switzerland, Mar. 27, 1987, 1170/87

Int. Cl.[4] C09B *44/00, 44/02, 44/06, 44/08*

U.S. Cl. 534—606 **15 Claims**

1. An azo dye of the formula



(1)

or tautomeric forms thereof, in which: Z is N, S or CH, X is O, S, NR^2 or N, V is N or CH, W is N or C, K is a coupling component selected from the group consisting of acylacetarylamides, phenols, pyridones, quinolines, pyrazoles, indoles, diphenylamines, aminopyridines, pyrimidines, pyrimidones, naphthols, naphthylamines, aminothioazoles, thiophenes and hydroxypyridines, R is C_1–C_6alkyl or C_2–C_6alkenyl, these groups being unsubstituted or substituted by OH, C_1–C_4alkoxy or C_1–C_4hydroxyalkoxy, R^1 is hydrogen, C_1–C_6alkyl, C_1–C_4alkoxy, halogen, nitro, —CN, NHR^2, —MH—C_2–C_6alkanoyl or —NH—benzoyl, each of which is unsubstituted or substituted by 1 to 3 C_1–C_4alkyl, chlorine or methoxy groups, phenoxy or phenoxy substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen or nitro, —$COOR^2$, —$CONHR^2$ or unsubstituted phenyl or phenyl substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen or nitro, R^2 being hydrogen, unsubstituted C_1–C_6alkyl or C_1–C_6alkyl substituted by OH, C_1–C_4alkoxy or C_1–C_4hydroxyalkoxy, unsubstituted phenyl, or phenyl substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen or nitro, D is a 1,4-phenylene radical which is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen, nitro or cyano, $An^{\ominus}$ is an anion and the ring A being not further substituted or this ring carrying a fused benzene ring which is unsubstituted or substituted by R^1.

4,880,917
PROCESS FOR HYDROLYZING 2,6-DIDEOXY-2,6-IMINOHEPTONONITRILE DERIVATIVES USING TRIFLUOROACETIC ACID AND DINITROGEN TETROXIDE

Peter B. Anzeveno, Zionsville; John K. Daniel; Laura J. Creemer, both of Indianapolis, all of Ind., and Paul S. Liu, Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jul. 1, 1988, Ser. No. 214,229

Int. Cl.[4] C07H *15/00, 17/00, 17/02*

U.S. Cl. 536—17.4 **5 Claims**

1. A process for converting an electron deficient carbonitrile to a carboxylic acid, said electron deficient carbonitrile being an amide of a 2,6-dideoxy-2,6-iminoheptononitrile wherein the amide is derived from a strong acid, which comprises treating the carbonitrile with trifluoroacetic acid followed by oxidative hydrolysis with dinitrogen tetroxide.

4,880,918
ARREST AND KILLING OF TUMOR CELLS BY ADENOSINE 5-DIPHOSPHATE AND ADENOSINE-5-TRIPHOSPHATE

Eliezer Rapaport, 1 Soldiers Field Park, Apt. 313, Boston, Mass. 02163

Filed Jul. 13, 1982, Ser. No. 397,897

Int. Cl.[4] C07H *19/16*; A61K *31/70*

U.S. Cl. 536—27 **32 Claims**

1. A process for selectively entering and arresting the growth of tumor cells in a host while substantially not affecting normal cells thereof comprising the step of exposing said tumor cells to low doses of at least one of adenosine 5'-diphosphate and adenosine 5'-triphosphate, in a pharmaceutical preparation, said low doses being in an amount sufficient to inhibit DNA synthesis in said tumor cells while said normal cells are substantially unaffected.

4,880,919
PROCESS FOR SEPARATING ARABINOSE FROM A MIXTURE OF ALDOSES

Santi Kulprathipanja, Des Plaines, Ill., assignor to UOP, Des Plaines, Ill.

Filed Dec. 31, 1986, Ser. No. 948,384

Int. Cl.[4] C07H *1/06*; C13K *1/00*

U.S. Cl. 536—127 **7 Claims**

1. A process for separating arabinose rom an aqueous feed mixture containing arabinose and at least one other monosaccharide, selected from the group consisting of aldopentoses and aldohexoses, which comprises contacting at adsorption conditions said mixture with an adsorbent comprising a nuclearly sulfonated cationic exchange resin having a crosslinked vinylaromatic resin matrix exchanged with $Ca^{++}$and NH_4^+ ions, selectively adsorbing said arabinose to the substantial exclusion of the other monosaccharides, removing the nonadsorbed portion of the feed mixture from contact with the adsorbent, and hereafter recovering high purity arabinose by desorption at desorption conditions.

4,880,920
PROCESS FOR SEPARATING KETOSES FROM ALKALINE-OR PYRIDINE-CATALYZED ISOMERIZATION PRODUCTS

Chin-Hsing Chang, Des Plaines, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 811,588, Dec. 20, 1985, Pat. No. 4,692,415. This application Sep. 4, 1987, Ser. No. 93,332

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] C07H *1/00*

U.S. Cl. 536—127 **7 Claims**

1. A process for recovering psicose having a purity of 20–99% (wt.) from a feed mixture comprising fructose and psicose and at least on ®other monosaccharide selected from the group consisting of glucose and mannose which comprises contacting at adsorption conditions said feed mixture with a adsorbent comprising a type Y zeolite having calcium cations at exchangeable sites, selectivley adsorbing said psicose preferentiallhy to said fructose and to the substantial exclusion of the other components, recovering an extract mixture comprising enriched psicose and fructose and then contacting said extract mixture with an adsorbent comprising a type Y zeolite having calcium cations at exchangeable sites, selectively adsorbing said psicose and recovering highly purified psicose by desorption at desorption conditions.

4,880,921

BRAIN-SPECIFIC DRUG DELIVERY

Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Division of Ser. No. 665,940, Oct. 29, 1984, Pat. No. 4,824,850, which is a continuation-in-part of Ser. No. 379,316, May 18, 1982, Pat. No. 4,479,932, and a continuation-in-part of Ser. No. 461,543, Jan. 27, 1983, abandoned, and a continuation-in-part of Ser. No. 475,493, Mar. 15, 1983, Pat. No. 4,622,218, and a continuation-in-part of Ser. No. 516,382, Jul. 22, 1983, Pat. No. 4,540,564. This application Jul. 20, 1987, Ser. No. 75,830

Claims priority, application Japan, Jun. 14, 1982, 57-101940; Canada, May 16, 1983, 428192; Ireland, May 17, 1983, 1149/83; South Africa, May 17, 1983, 83/3521; Spain, May 17, 1983, 522489; Italy, May 18, 1983, 48327 A/83

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

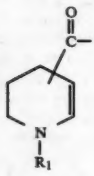
Int. Cl.[4] C07J *43/00*

U.S. Cl. 540—110 **54 Claims**

1. A compound of the formula

D—DHC]$_n$ (Ia)

or a non-toxic pharmaceutically acceptable salt thereof, wherein D is the residue of an antiinflammatory steroid having at least one reactive hydroxyl functional group, one such hydroxyl group being a 21-hydroxy substituent, said residue being characterized by the absence of a hydrogen atom from at least one of said reactive hydroxyl functional groups in said drug; n is a positive integer equal to the number of said functional groups from which a hydrogen atom is absent; and [DHC] is a radical of the formula



wherein the dotted line indicates the presence of a double bond in either the 4 or 5 position of the dihydropyridine ring; R_1 is C_1–C_7 alkyl, C_1–C_7 haloalkyl or C_7–C_{10} aralkyl; and the carbonyl grouping is attached at the 2, 3 or 4 position of the dihydropyridine ring.

4,880,922

CARBAPENEMS WITH QUATERNIZED HETEROTHIOALKYLTHIO SUBSTITUTION AT POSITION 2

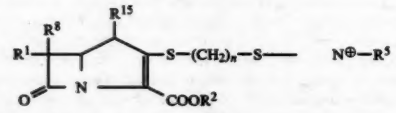
Pierre Dextraze, Quebec, Canada, assignor to Bristol-Myers Company, New York, N.Y.

Filed Nov. 22, 1985, Ser. No. 800,867

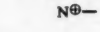
Int. Cl.[4] C07D *487/04*; A01K *31/40*

U.S. Cl. 540—350 **5 Claims**

1. A compound of the formula



wherein R^8 is hydrogen and R^1 is hydroxyethyl; R^5 is C_1–C_6 alkyl; R^{15} is hydrogen or methyl; n is an integer of 1, 2 or 3; R^2 is hydrogen, an anionic charge or a conventionsl readily removable carboxyl protecting group, provided that when R^2 is hydrogen or a protecting group, there is also present a counter ion; and



represents an aromatic 5- or 6-membered N-containing heterocyclic ring containing 0–3 additional hetero atoms selected from 0, S or N, said aromatic ring being optionally substituted at available ring carbon or nitrogen atoms by C_1–C_4 alkyl substituents, and said ring being attached to S through a ring carbon atom and having a ring nitrogen which is quaterized by the group R^5; or a pharmaceutical acceptable salt thereof.

4,880,923

MACROCYCLIC POLYAMINE AND POLYCYCLIC POLYAMINE MULTIFUNCTIONAL LUBRICATING OIL ADDITIVES

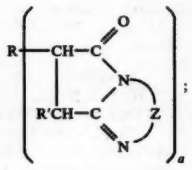
Stanley J. Brois, Westfield, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

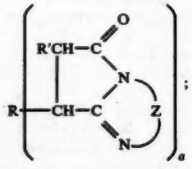
Division of Ser. No. 550,977, Nov. 16, 1983, Pat. No. 4,637,886, which is a continuation-in-part of Ser. No. 453,143, Dec. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 415,980, Sep. 8, 1982, abandoned, which is a division of Ser. No. 243,781, Mar. 16, 1981, abandoned, Continuation of Ser. No. 67,546, Aug. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 817,217, Jul. 20, 1977, Pat. No. 4,174,322, which is a continuation-in-part of Ser. No. 806,326, Jun. 13, 1977, Pat. No. 4,167,514, which is a division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Sep. 2, 1986, Ser. No. 902,779

Int. Cl.[4] C07D *487/04*

U.S. Cl. 540—471 **7 Claims**

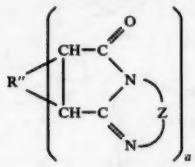
1. Macrocyclic polyamine compound being a member of the group of compounds and mixtures thereof represented by the formulas:





and

-continued



where R' is hydrogen or lower C_1–C_{12} alkyl; R is a hydrocarbon substituent having 2 to 15,000 carbon atoms; R'' is a hydrocarbon substituent of 4 to 15,000 carbon atoms; Z is $-CH_2CH_2CH_2-$, $-(CH_2CH_2CH_2NH)_nCH_2CH_2CH_2-$ where n is 1–6, or $(CH_2CH_2CH_2NH)_mCH_2(CH_2)_p(NHCH_2CH_2CH_2)_{m'}-$ where m and m' are each at least 1 and m+m' is 2–5, p is 1–4; and a is 1–20.

4,880,924

NOVEL COMPOUNDS AND USE THEREOF IN SELECTIVE CYCLIZATION PROCESS

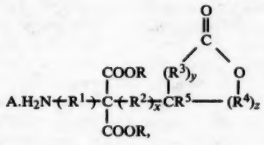
James V. Peck, Costa Mesa, and Gevork Minaskanian, Irvine, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.

Filed Apr. 3, 1986, Ser. No. 847,639

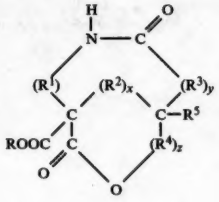
Int. Cl.[4] C07D *491/06*

U.S. Cl. 540—520 **14 Claims**

1. A process for converting a first compound, represented by the general formula:



selectively, into a second compound represented by the general formula



wherein R is an alkyl radical having from one to eight carbon atoms; R^1 is a divalent hydrocarbyl or heteroatom-substituted hydrocarbyl radical providing at least two carbon atoms between the nitrogen atom and the 1-carbon atom; R^2, R^3 and R^4 are divalent hydrocarbyl or heteroatom-substituted hydrocarbyl radicals; R^5 is hydrogen or a hydrocarbyl or heteroatom-substituted hydrocarbyl radical; A is an acid having a pKa of 0 or more; x is 0; y and z are 0 or 1, provided at least one of y and z is not 0, and said heteroatoms are selected from the group consisting of nitrogen, oxygen, sulfur, phosphorus and halogen atoms, which comprises cyclizing said first compound in the absence of a base.

4,880,925

INTERMEDIATES FOR THE PRODUCTION OF TETRAHYDROPHTHALIMIDES

Eiki Nagano, Nishinomiya; Toru Haga, Takarazuka; Ryo Sato, and Kouichi Morita, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

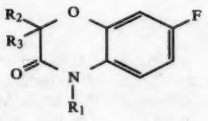
Division of Ser. No. 914,496, Oct. 2, 1986, Pat. No. 4,772,605, which is a division of Ser. No. 756,251, Jul. 18, 1985, Pat. No. 4,640,707. This application Sep. 20, 1988, Ser. No. 246,783

Claims priority, application Japan, Jul. 23, 1984, 59-152721; Aug. 3, 1984, 59-164020; Sep. 20, 1984, 59-198245

Int. Cl.[4] C07D *265/36*

U.S. Cl. 544—105 **3 Claims**

1. A compound of the formula:



wherein R_1 is a hydrogen atom, and R_2 and R_3 are, the same or different, each a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group or a phenyl group.

4,880,926

OPTICAL RESOLUTION OF BENZOXAZINES

Toshihiro Fujiwara; Hideaki Tsurumi, and Yukio Sato, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

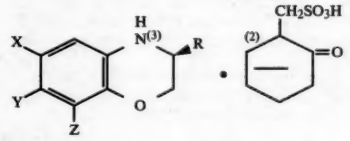
Filed Aug. 3, 1988, Ser. No. 227,925

Claims priority, application Japan, Aug. 3, 1987, 62-194017; Aug. 3, 1987, 62-194018

Int. Cl.[4] C07D *265/36*

U.S. Cl. 544—105 **4 Claims**

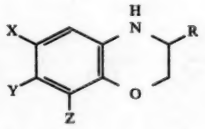
1. A salt of an (S)-3-alkyl-benzoxazine derivative with (R)-(−)-camphor-10-sulfonic acid which has the general formula (V)'



(V)'

wherein X, Y and Z, which may be the same or different, each represents a hydrogen atom or a halogen atom and R represents a lower alkyl group having 1 to 6 carbon atoms.

3. A process for producing an optically active benzoxazine compound which comprises subjecting a (±)-3-alkyl-3,4-dihydro-2H-[1,4]benzoxazine derivative of the general formula (II)



(II)

wherein X, Y and Z, which may be the same or different, each represents a hydrogen atom or a halogen atom and R represents a lower alkyl group having 1 to 6 carbon atoms, to optical resolution using an optically active form of camphor-10-sulfonic acid as an optical resolution reagent.

4,880,927

METHOD FOR PREPARING A CYCLIC ISOCYANURIC ESTER HAVING ORGANOSILICON GROUPS

Toshio Takago, Annaka, and Yasushi Yamamoto, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

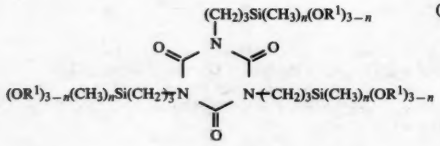
Filed Dec. 3, 1987, Ser. No. 129,939
Claims priority, application Japan, Dec. 3, 1986, 61-288235
Int. Cl.[4] C07D *251/34*
U.S. Cl. 544—193 **15 Claims**

1. A method for preparing an organosilicon group-containing cyclic isocyanuric ester, the method comprising:

thermally treating or heating an isocyanic ester of the following formula (1) at a temperature sufficient for cyclization reaction of the isocyanic ester

$$(R^1O)_{3-n}(CH_3)_nSi(CH_2)_3NCO \quad (1)$$

in which R^1 represents an alkyl group having from 1 to 4 carbon atoms, and n is 0 or 1, for cyclization reaction in the presence of a basic catalyst of the formula, MOR^2, in which R^2 represents a hydrogen atom or an alkyl group having from 1 to 5 carbon atoms and M represents an alkali metal to obtain an organosilicon group-bearing cyclic isocyanuric ester of the following formula (2)



(2)

in which R^1 and n have, respectively, the same meanings as defined above.

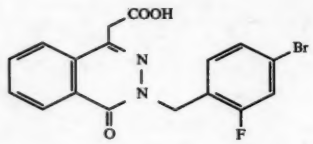
4,880,928

PROCESS FOR THE PREPARATION OF 3-((4-BROMO-2-FLUOROPHENYL)METHYL)-3,4-DIHYDRO-4-OXO-1-PHTHALAZINE-ACETIC ACID

Richard F. Shuman, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

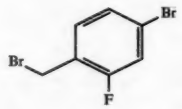
Continuation-in-part of Ser. No. 135,885, Dec. 21, 1987, abandoned. This application May 23, 1988, Ser. No. 197,481
Int. Cl.[4] C07D *237/32*
U.S. Cl. 544—237 **22 Claims**

1. A process for the preparation of a compound of the formula



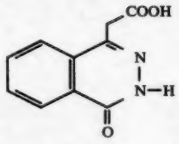
III

which comprises reacting a compound of the formula



II

with a compound of the formula



I

in a protic polar solvent, an aprotic polar solvent, or a mixture of a protic polar solvent and an aprotic polar solvent in the presence of a tetraalkyl or phenyl substituted tertraalkyl ammonium hydroxide.

4,880,929

PROCESS FOR PREPARING A 2-ALKYL-1,4,5,6-TETRAHYDROPYRIMIDINE

Antonius J. J. M. Teunissen, Geleen; Willem Klop, Limbricht, and Hubertus J. A. V. Delahaye, Voerendaal, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 16, 1987, Ser. No. 97,657
Claims priority, application Netherlands, Dec. 12, 1986, 8603168
Int. Cl.[4] C07D *239/26, 239/36*
U.S. Cl. 544—242 **13 Claims**

1. Process for preparing a 2-alkyl-1,4,5,6-tetrahydropyrimidine with the formula

where R represents a straight or branched chain with 1–8 C-atoms or a phenyl group from 1,3-diaminopropane and an alkanecarboxylic acid, in which the alkyl group of such an acid is the same as the R group described above, wherein the starting materials are reacted in the gas phase in the presence of a metal oxide catalyst having an oxidizing or dehydrating effect and wherein said metal oxide catalyst includes a metal or metals selected from the group consisting of the elements of groups 3, 4 and 5 of the periodic system, at a temperature of between 250° and 450° C. and from the reaction mixture thus obtained the 2-alkyl-1,4,5,6-tetrahydropyrimidine is recovered.

2. Process according to claim 1, wherein the chosen alkanecarboxylic acid is pivalic acid or acetic acid.

11. Process for preparing a 2-alkylpyrimidine with the formula

where R represents a straight or branched chain with 1–8 C-atoms or a phenyl group from 1,3-diaminopropane and an alkanecarboxylic acid, in which the alkyl group of such an acid is the same as the R group described above, wherein in the first step the starting materials are reacted in a gas phase in the presence of a metal oxide catalyst having an oxidizing or dehydrating effect and wherein said metal oxide catalyst includes a metal or metals selected from the group consisting of the elements of groups 3, 4 and 5 of the periodic system, at a temperature of between 250° and 450° C. and subsequently, in a second step, the reaction mixture obtained is dehydrogenated in the gas phase in the presence of a dehydrogenating catalyst including an element of group 8 at a temperature of between

250° and 400° C. and finally, from the reaction mixture obtained in the second step, the 2-alkylpyrimidine is recovered.

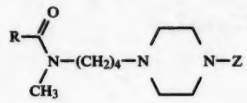
4,880,930

PSYCHOTROPIC ACYCLIC AMIDE DERIVATIVES

James S. New, 168 Bradley Corners, Madison, Conn. 06483

Filed Nov. 30, 1987, Ser. No. 126,819
Int. Cl.[4] C07D *403/04, 413/04, 417/04*
U.S. Cl. 544—295 26 Claims

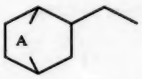
1. A compound of Formula I or a pharmaceutically acceptable acid addition salt thereof



I

wherein

R is selected from C_{4-8} alkyl, alkenyl and cycloalkylmethyl, and C_{8-9} bicyclo hydrocarbon moieties of structure



in which A is methylene or ethylene and the full line accompanying the dotted line is a single or double covalent bond; and

Z is a heterocyclic ring system selected from pyrimidin-2-yl, 1,2-benzisothiazol-3-yl, thieno[3,2-c]pyridin-4-yl and furo[3,2-c]pyridin-4-yl.

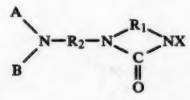
4,880,931

ACRYLOXY-CONTAINING COMPOUNDS

George E. Abboud, Ajax, Canada; Christopher H. Such, Mount Eliza, Australia; Susan M. Horley, Loudwater, and Julian A. Waters, Goring-On-Thames, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 815,313, Jan. 2, 1986, Pat. No. 4,783,539, which is a continuation of Ser. No. 436,355, Oct. 25, 1982, abandoned. This application Jul. 13, 1988, Ser. No. 218,278
Claims priority, application United Kingdom, Oct. 23, 1981, 8132086; Apr. 30, 1982, 8212639
Int. Cl.[4] C07D *233/36, 239/10*
U.S. Cl. 544—316 7 Claims

1. A polymerisable monomer of the structure



wherein R_1 and R_2 are the same or different alkylene groups containing 2 or 3 carbon atoms, A is an alkyl group containing 2 to 18 carbon atoms substituted with at least one hydroxyl or cyano group, B is an acryloxyalkyl wherein the alkyl group contains 2 to 18 carbon atoms and is unsubstituted or substituted with a hydroxyl group and X is hydrogen, $C_{1\ to}$ 18 alkyl or

and wherein A and B are each linked to the nitrogen through a carbon atom.

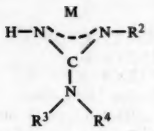
4,880,932

SUBSTITUTED GUANIDINE DERIVATIVES

Koichi Moriya, Hachioji; Theodor Pfister, Monheim; Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, Fed. Rep. of Germany, and Klaus Lürrsen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

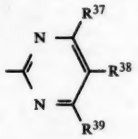
Continuation-in-part of Ser. No. 853,822, Apr. 18, 1986, Pat. No. 4,721,785, which is a division of Ser. No. 578,345, Feb. 9, 1984, Pat. No. 4,602,938. This application Apr. 29, 1987, Ser. No. 44,083
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307679; Sep. 23, 1983, 3334455
Int. Cl.[4] C07D *239/34, 239/42, 239/52, 239/48*
U.S. Cl. 544—320 5 Claims

1. A guanidine derivative of the formula



in which

R^2 represents the radical



wherein

R^{37} represents hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine),

R^{38} represents hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), cyano, formyl, C_1–C_4-alkyl-carbonyl or C_1–C_4-alkoxy-carbonyl, and

R^{39} represents C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino;

R^3 represents hydrogen or C_1–C_4-alkyl; and

R^4 represents the radical —O—R^8,

R^8 represents C_1–C_6-alkyl (which is optionally substituted by fluorine, chlorine, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl), C_3–C_6-alkenyl, C_3–C_6-alkinyl, C_3–C_6-cycloalkyl, benzyl (which is optionally substituted by fluorine, chlorine or methyl) or phenyl (which is optionally substituted by fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, trifluoromethoxy, C_1–C_4-alkylthio or trifluoromethylthio); or

R^4 represents the radical

wherein

R^9 represents hydrogen or C_1–C_4-alkyl and

R^{10} represents C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl), C_3–C_6-alkenyl, C_3–C_6-alkinyl, C_3–C_6-cycloalkyl (which is optionally interrupted by a $-SO_2$ bridge), benzyl or phenylethyl (which are optionally substituted by fluorine, chlorine or methyl), phenyl (which is optionally substituted by fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, trifluoromethoxy, C_1–C_4-alkylthio or trifluoromethylthio), pyrimidyl, C_1–C_4-alkyl-carbonyl, benzoyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkyl-sulphonyl or phenylsulphonyl (which is optionally substituted by fluorine, chlorine, bromine or methyl).

4,880,933

NITRO- OR CYANO-DERIVATIVES OF 2-IMINO-IMIDAZOLINES AND 2-IMINO-TETRAHYDROPYRIMIDINES

Kozo Shiokawa, Kawasaki; Shinichi Tsuboi, Hino; Koichi Moriya, Tokyo, and Katsuhiko Shibuya, Hachioji, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

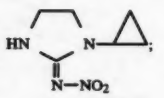
Filed Dec. 8, 1987, Ser. No. 130,376

Claims priority, application Japan, Dec. 19, 1986, 61-301333

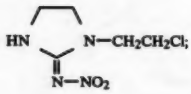
Int. Cl.[4] **C07D** *233/52, 239/18, 401/06, 417/04, 407/06*

U.S. Cl. 544—332 **2 Claims**

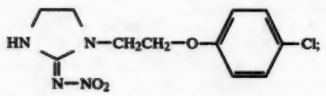
1. A compound selected from the group consisting of 1-cyclopropyl-2-nitroiminoimidazolidine of the formula:



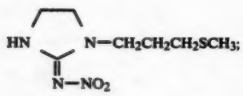
1-(2-chloroethyl)-2-nitroiminoimidazolidine of the formula:



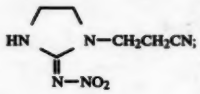
1-[2-(4-chlorophenoxy)ethyl]-2-nitroiminoimidazolidine of the formula:



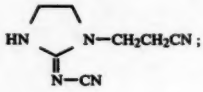
1-(3-methylthiopropyl)-2-nitroiminoimidazolidine of the formula:



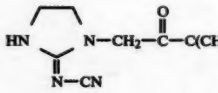
1-(2-cyanoethyl)-2-nitroiminoimidazolidine of the formula:



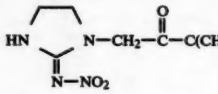
1-(3-cyanopropyl)-2-cyanoiminoimidazolidine of the formula:



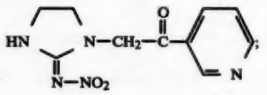
1-(3,3-dimethyl-2-butanon-1-yl)-2-cyanoiminoimidazolidine of the formula:



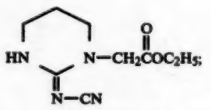
1-(3,3-dimethyl-2-butanon-1-yl)-2-nitroiminoimidazolidine of the formula:



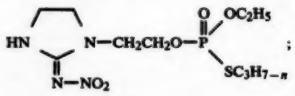
2-nitroimino-1-(3-pyridylcarbonylmethyl)imidazolidine of the formula:



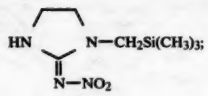
2-cyanoimino-1-ethoxycarbonylmethyltetrahydropyrimidine of the formula:



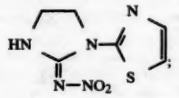
1-[2-(O-ethyl-S-propylthiophosphonoxy)ethyl]-2-nitroiminoimidazolidine of the formula:



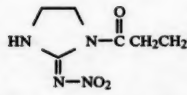
2-nitroimino-1-trimethylsilylmethylimidazolidine of the formula:



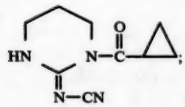
2-nitroimino-1-(2-thiazolyl)imidazolidine of the formula:



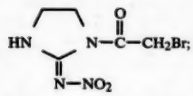
2-nitroimino-1-propylcarbonylimidazolidine of the formula:



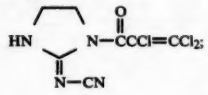
2-cyanoimino-1-cyclopropylcarbonyltetrahydropyrimidine of the formula:



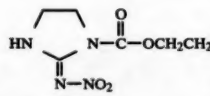
1-bromoacetyl-2-nitroiminoimidazolidine of the formula:



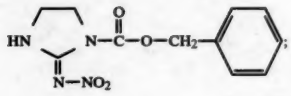
2-cyanoimino-1-trichloroacryloylimidazolidine of the formula:



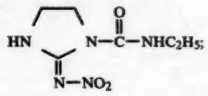
1-(2-methoxyethoxycarbonyl)-2-nitroiminoimidazolidine of the formula:



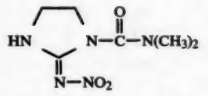
1-benzyloxycarbonyl-2-nitroiminoimidazolidine of the formula:



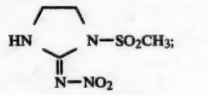
1-ethylaminocarbonyl-2-nitroiminoimidazolidine of the formula:



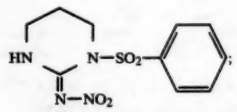
1-dimethylaminocarbonyl-2-nitroiminoimidazolidine of the formula:



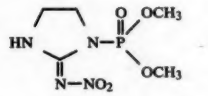
1-methylsulfonyl-2-nitroiminoimidazolidine of the formula:



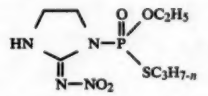
2-nitroimino-1-phenylsulfonyltetrahydropyrimidine of the formula:



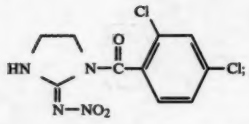
1-(O,O-dimethylphosphono)-2-nitroiminoimidazolidine of the formula:



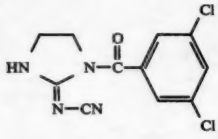
1-(O-ethyl-S-propylthiophosphono)-2-nitroiminoimidazolidine of the formula:



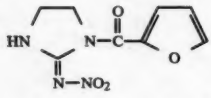
1-(2,4-dichlorobenzoyl)-2-nitroiminoimidazolidine of the formula:



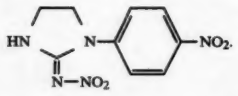
1-(3,5-dichlorobenzoyl)-2-cyanoiminoimidazolidine of the formula:



1-(2-furoyl)-2-nitroiminoimidazolidine of the formula:



2. 1-(4-Nitrophenyl)-2-nitroiminoimidazolidine of the formula



4,880,934

PREPARATION OF HYDROXYALKYLPIPERAZINONES BY REACTING A 2,3-DIHYDROXY-1,4-DIOXANE WITH A HYDROALKYLDIAMINE

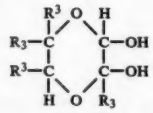
Duane S. Treybig, and John M. Motes, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 85,428, Aug. 13, 1987, Pat. No. 4,814,443. This application Dec. 5, 1988, Ser. No. 279,906

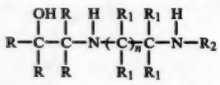
Int. Cl.[4] C07D *241/08*

U.S. Cl. 544—384 **16 Claims**

1. A process for preparing 4-(2-hydroxyalkyl)-2-piperazinones and their substituted derivatives which comprises: (1) reacting a compound having the formula



wherein R_3 is hydrogen or an alkyl group having from 1–4 carbon atoms, with (2) an N-hydroxyalkylalkylenediamine having the formula



wherein R is hydrogen or an alkyl group of 1 or 2 carbon atoms, R_1 is hydrogen, an alkyl group of 1 to 6 carbon atoms, an aryl or an aralkyl group having from 6 to 12 carbon atoms, R_2 is hydrogen, an alkyl or hydroxyalkyl group of 1–6 carbon atoms, an aryl or an aralkyl group having from 6 to 12 carbon atoms and n is 1 or 2.

4,880,935

HETEROBIFUNCTIONAL LINKING AGENTS DERIVED FROM N-SUCCINIMIDO-DITHIO-ALPHA METHYL-METHYLENE-BENZOATES

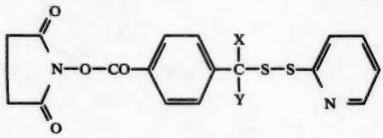
Philip E. Thorpe, London, England, assignor to ICRF (Patents) Limited, London, England

Continuation of Ser. No. 884,641, Jul. 11, 1986, abandoned. This application Aug. 27, 1987, Ser. No. 90,386

Int. Cl.[4] C07D *207/46, 207/48, 401/12*

U.S. Cl. 546—281 **4 Claims**

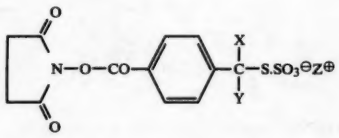
1. A compound of the formula:



(V)

wherein X is a C_1–C_4 alkyl group and Y is H or a C_1–C_4 alkyl group and $Z^{\oplus}$ is a pharmaceutically acceptable cation.

3. A compound of the formula:



(VI)

wherein X is a C_1–C_4 alkyl group and Y is H or a C_1–C_4 alkyl group and $Z^{\oplus}$ is a pharmaceutically acceptable cation.

4,880,936

OPTICALLY ACTIVE PYRIDINES USEFUL IN LIQUID CRYSTAL FORM FOR ELECTRICAL DISPLAY DEVICES

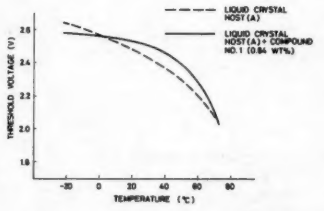
Makoto Sasaki, Saitama; Kiyohumi Takeuchi, and Haruyoshi Takatsu, both of Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 172,923

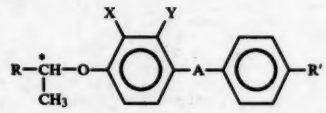
Claims priority, application Japan, Mar. 26, 1987, 62-70174

Int. Cl.[4] C07D *213/30*

U.S. Cl. 546—339 **19 Claims**

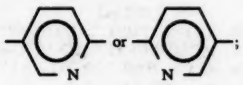


1. An optically active compound represented by formula (I):



(I)

wherein R represents a straight chain alkyl group having from 2 to 12 carbon atoms; R' represents a straight chain alkyl or alkoxy group having from 1 to 20 carbon atoms; represents an asymmetric carbon atom; A represents



and X and Y each represents a hydrogen atom or a fluorine atom, provided that X and Y do not simultaneously represent a fluorine atom.

4,880,937

METHOD OF PRODUCING ALCOHOL COMPOUNDS

Hajime Matsushita, Yokohama; Makoto Shibagaki, Kawasaki, and Kyoko Takahashi, Tokyo, all of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

Filed Feb. 18, 1988, Ser. No. 157,246
Claims priority, application Japan, Mar. 3, 1987, 62-46706
Int. Cl.[4] C07D *213/30*; C07C *31/135, 33/00, 29/136*
U.S. Cl. 546—344 **28 Claims**

1. A method of producing an alcohol compound, comprising, allowing a carboxylic acid compound selected from the group consisting of C_2–C_{18} unsubstituted chain carboxylic acid, 2-methyl-pentanoic, pivaric, acrylic, oleic, cyclohexane carboxylic acid benzoic acid or their ethyl ester, nicotinic acid, isonicotinic acid or their methyl ester thereof to come into contact with a reducing agent consisting of an alcohol selected from the group consisting of alkanols having 2 to 6 carbon atoms and benzyl alcohol, in the presence of a solid catalyst consisting of a hydrous oxide selected from the group consisting of hydrous zirconium oxide, hydrous titanium oxide and hydrous tin oxide, thereby reducing said carboxylic compound to its corresponding alcohol compound.

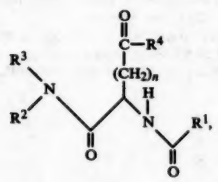
4,880,938

AMINO ACID ANALOGS

Roger M. Freidinger, Hatfield, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

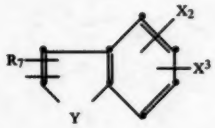
Filed Jun. 16, 1986, Ser. No. 874,928
Int. Cl.[4] C07D *209/18*
U.S. Cl. 548—492 **6 Claims**

1. A compound of the formula:

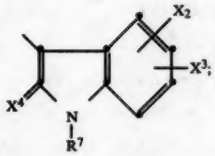


(I)

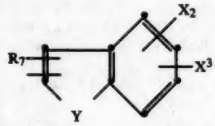
wherein:
R^1 is $(CH_2)_m$—R^5 or X^1—$(CH_2)_m$—R^6;
R^2 and R^3 are independently selected from H; C_1–C_8-straight- or branched-chain-alkyl; C_3–C_8-cycloalkyl; with the proviso that R^2 and R^3 cannot both be H concurrently;
R^4 is OH; C_1–C_4-straight- or branched-chain-alkoxy; C_3–C_6-cycloalkoxy; OCH_2-phenyl; amino-mono- or di-C_1–C_4-straight- or branched-chain-alkyl; amino-mono- or di-C_3–C_6-cycloalkyl; or NH—CH_2-phenyl;
R^5 is



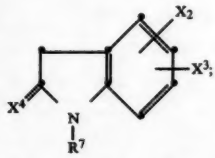
or



R^6 is



or



R^7 is H; C_1–C_4-straight- or branched-chain-alkyl;
X^1 is O or NH;
X^2 and X^3 are independently H; OH; NO_2; halo; C_1–C_4-straight- or branched-chain-alkyl; C_1–C_4-straight- or branched-chain-alkylthio; or C_1–C_4-straight- or branched-chain-akoxy;
X^4 is O or HH;
Y is NR^7;
n is 1-to-3;
m is 0-to-4; and
halo is F, Cl, Br, or I;
or pharmaceutically-acceptable salts of these compounds.

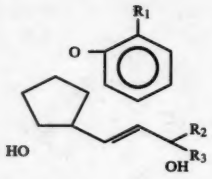
4,880,939

2,5,6,7-TETRANOR-18,18,19,19-TETRADEHYDRO-4,8-INTER-M-PHENYLENE PGI_2 DERIVATIVES

Kiyotaka Ohno, Fujisawa; Toshiya Takahashi, Kamakura, and Shintaro Nishio, Ebina, all of Japan, assignors to Toray Industries, Japan

Filed Dec. 4, 1987, Ser. No. 128,878
Claims priority, application Japan, Dec. 11, 1986, 61-295367
Int. Cl.[4] C07D *307/77, 307/93*
U.S. Cl. 549—458 **1 Claim**

1. A 2,5,6,7-tetranor-18,18,19,19-tetradehydro-4,8-inter-m-phenylene PGI_2 derivative represented by the formula:



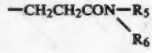
wherein:

R_1 is

(i) $-CH_2CH_2COOR_4$,

(ii) $-CH_2CH_2CH_2OH$, or

(iii)



in which R_4 is hydrogen, or a pharmacologically acceptable cation or ester residue, and R_5 and R_6 may be same or different and are independently selected from the class consisting of hydrogen, normal alkyl groups having 1 to 12 carbon atoms, branched alkyl groups having 3 to 12 carbon atoms, cycloalkyl groups having 3 to 12 carbon atoms, cycloalkylalkylene groups having 4 to 13 carbon atoms, and phenyl;

R_2 is hydrogen, methyl, ethyl or propyl; and

R_3 is $-C_tH_{2t}-C\equiv C-R_7$

in which C_tH_{2t} represents a normal or branched alkylene group, t is an integer having a value of 1 to 6, and R_7 is a normal alkyl group having 1 to 6 carbon atoms.

4,880,940

4-ALKOXY-3-PYRROLIN-2-ON-1-YL ACETIC ACID ALKYL ESTERS

Thomas Muel; Leander Tenud, both of Visp; Laurent Duc, Sion, and John McGarrity, Visp, all of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

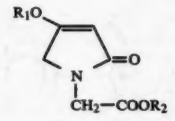
Continuation of Ser. No. 907,012, Sep. 15, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 147,275

Claims priority, application Switzerland, Sep. 24, 1985, 4119/85; May 14, 1986, 1958/86; Jun. 19, 1986, 2486/86

Int. Cl.[4] C07D *207/38*

U.S. Cl. 548—544 **3 Claims**

1. 4-Alkoxy-3-pyrrolin-2-on-1-yl acetic acid-(C_1–C_4)-alkyl ester of the formula:



wherein R_1 is a (C_1–C_2)-alkyl and R_2 is a (C_1–C_4)-alkyl or benzyl.

3. The composition comprising 4-methoxy-3pyrrolin-2-on-1-yl acetic acid methyl ester in carbon tetrachloride.

4,880,941

TRITTUM LABELLED COMPOUND, ITS PREPARATION AND ITS USE IN THE DETERMINATION OF THE AFFINITY OF RETINOIDS FOR THEIR CELLULAR RECEPTOR

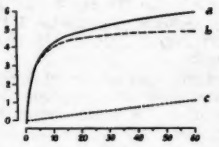
Braham Shroot, Antibes; Oliver Watts, Cagnes sur Mer; Joseph Gazith, Biot, and Marie-Thérèse Cavey, Valbonne, all of France, assignors to Centre International de Recherches Dermatologique (CIRD), Valbonne, France

Filed Aug. 28, 1987, Ser. No. 90,324

Claims priority, application France, Aug. 29, 1986, 86 12237

Int. Cl.[4] C07D *333/54*

U.S. Cl. 549—57 **4 Claims**



1. Tritium labelled 2-(5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-2-naphthyl)-6-benzo [b] thiophene carboxylic acid.

4,880,942

PREPARATION OF CYCLIC CARBONATES

Yoshihisa Kiso, Iwakuni; Yuuichi Matsunaga, Kuga, and Masao Imagawa, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,414

Claims priority, application Japan, Jul. 22, 1987, 62-180984

Int. Cl.[4] C07D *317/12, 323/04*

U.S. Cl. 549—228 **6 Claims**

1. A process for preparing a cyclic carbonate, comprising the steps of:

reacting at least one diol selected from the group consisting of 1,3-diols and 1,2-diols with a dialkylcarbonate in the presence of a basic catalyst under approximately atmospheric pressure or under pressure,

subjecting the reaction mixture to heat aging under vacuum in the presence of a basic catalyst, and

isolating the resulting cyclic carbonate from the mixture.

4,880,943

BOUND FLAT WIRING HARNESS, BENT FLAT WIRING HARNESS, AND METHODS OF PRODUCING EACH

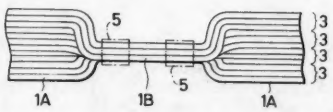
Katsutoshi Kuzuno; Hiroshi Watanabe, and Shigeo Ishizuka, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

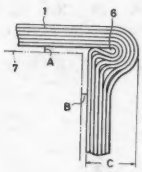
Filed Mar. 22, 1989, Ser. No. 327,253

Claims priority, application Japan, Apr. 18, 1988, 63-51001[U]; Apr. 18, 1988, 63-51002[U]

Int. Cl.[4] H01B *7/00;* H02G *1/00*

U.S. Cl. 174—72 A 12 Claims





1. A method of binding a flat wiring harness, comprising the steps of:

(a) arranging a plurality of covered wires in parallel relationship in the same plane and bonding them in an easily separable manner thereby forming a flat wiring harness;

(b) separating said covered wires by a predetermined, identical number between adjacent covered wires over a predetermined length thereby dividing them into a plurality of small bundles;

(c) separating both end portions of all of the covered wires in each of said small bundles between the adjacent covered wires; and

(d) laying said plurality of small bundles one on top of the other and binding them up together in an easily separable manner.

9. A flat wiring harness, comprising both wide end portions of a plurality of covered wires bonded in the same plane in an easily separable manner, and an intermediate bound portion located between said wide end portions and consisting of small bundles each including a predetermined number of covered wires, said individual covered wires having slits formed therebetween in both end portion of said intermediate bound portion, said intermediate bound portion being bound up together in such a manner that it can be separated easily into the small bundles.

10. A method of bending a flat wiring harness comprising the steps of:

(a) arranging a plurality of covered wires in parallel relationship in the same plane and bonding them in an easily separable manner thereby forming a flat wiring harness;

(b) forming a slit between adjacent covered wires in the portions of said flat wiring harness to be bent later; and

(c) bending the flat wiring harness formed with said slits so as to locate the slackening portion of each of the covered wires resulting from the difference in arc length between the inner and outer peripheries thereof at its bend outside the bend.

12. A flat wiring harness, comprising both end portions of a plurality of covered wires bonded in the same plane in an easily separable manner, and bends of said covered wires located between said both end portions and bent in said plane, the slackening portion of each of the covered wires resulting from the difference in arc length between the inner and outer peripheries thereof at its bend being located outside the bend.

4,880,944

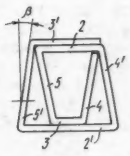
BAR FOR INDUCTION DEVICES

Viktor L. Kanaljuk; Anatoly M. Surakov; Vasily M. Chornogotsky, and Lazar N. Shifrin, all of Zaporozhie, U.S.S.R., assignors to Nauchno-Issledovatelsky, Proektno-Konstruktorsky I Tekhnologichesky Institut Transformatorostroeniya, Zaporozhie, U.S.S.R.

Filed Feb. 3, 1988, Ser. No. 151,822

Int. Cl.[4] H01B *17/56;* H01F *27/08;* B32B *1/08*

U.S. Cl. 174—138 E 2 Claims



2. An insulation bar for oil barrier insulation of induction devices, formed from a strip of electric insulating material rolled up into a hollow trapezoidal prism, an inner longitudinal edge of said strip abutting an inner corner of the hollow trapezoidal prism formed by sides thereof, with the strip being rolled up repeatedly, said hollow trapezoidal prism is encompassed by a successive hollow trapezoidal prism which adjoins the encompassed hollow trapezoidal prism along parallel sides, the smaller side of the encompassed trapezoidal prism adjoining the larger side of the encompassing trapezoidal prism.

4,880,945

ELECTRIC SWITCH FOR CONTROLLING CHANGE-OF-DIRECTION INDICATORS ON A MOTOR VEHICLE

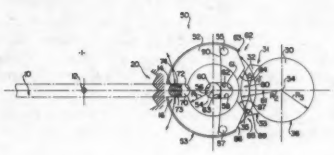
Christian Gauthier, Paris, France, assignor to Jaeger, Levallois Perret, France

Filed May 6, 1988, Ser. No. 191,267

Claims priority, application France, May 7, 1987, 87 06496

Int. Cl.[4] H01H *3/18*

U.S. Cl. 200—61.54 16 Claims



1. An electric switch cooperating with a steering wheel shaft provided with a control cam for controlling change of direction indicators of a motor vehicle, including:

a support casing;

a control lever pivotally mounted on said support casing about a first pivot axis;

a reversing plate pivotally mounted on said support about a second axis which is parallel to said first pivot axis, said reversing plate facing said control cam provided on the steering wheel shaft and being able to move relative to the second axis away from the control cam;

drive structures provided on said reversing plate for cooperating with the lever so that the reversing plate is pivoted about said second axis into a working position, in response

to the control lever itself being pivoted about said first axis into a working position;

said reversing plate including slopes so that the slopes interfere with the rotary path of the control cam when the reversing plate is in the working position;

a spring resiliently urging said reversing plate towards the steering wheel shaft;

an indexing notched surface provided on said support casing, and

an indexing stud provided on said lever, said stud being resiliently urged against said notched surface.

4,880,946

HIGH-OR MEDIUM-TENSION COMPRESSED-GAS CIRCUIT BREAKER TAKING CIRCUIT-BREAKING ENERGY FROM THE ARC

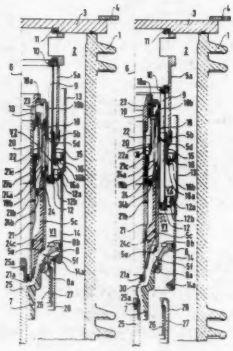
Edmond Thuries, Pusignan; Denis Dufournet, Bron, and Michel Perret, Bourgoin-Jallieu, all of France, assignors to Societe Anonyme dite: Alsthom, Paris, France

Filed Jul. 21, 1988, Ser. No. 222,641

Claims priority, application France, Aug. 3, 1987, 87 10988

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **6 Claims**



1. A high- or medium-tension compressed gas circuit breaker taking circuit-breaking energy from the arc, the circuit breaker being of the type comprising:

a fixed assembly including main contacts and arc contacts;

a moving assembly including main contacts and arc contacts;

a blast volume including a piston which moves on contact separation and urges compressed gas through a blast nozzle which opens over the zone where a main arc forms when the arc contacts separate, and

a set of auxiliary contacts in series with the arc contacts for creating an auxiliary arc in the volume situated behind the piston,

the circuit breaker further including means for allowing the auxiliary contacts to separate only when the pressure in the blast zone reaches a predetermined threshold.

4,880,947

VACUUM INTERRUPTER WITH SIMPLIFIED ENCLOSURE AND METHOD OF ASSEMBLY

Maurice G. Fey, Pittsburgh; William J. Lange; Carl B. Freidhoff, both of Murrysville, and Paul G. Slade, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1988, Ser. No. 212,850

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B **20 Claims**

1. A vacuum interrupter comprising:

a vacuum enclosure;

a pair of contacts, including at least one movable contact, enclosed by said vacuum enclosure and having respective electrical terminals connected thereto and communicating through said vacuum enclosure;

said vacuum enclosure comprising a plurality of enclosure elements with one or more seals therebetween of a cured polymeric material.

4,880,948

CONTACTOR DEVICE FOR CIRCUIT BREAKER

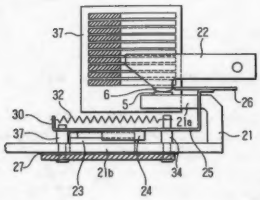
Kiyoshi Kandatsu; Makoto Yamazaki, and Hiroshi Kinota, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1988, Ser. No. 263,204

Claims priority, application Japan, Nov. 9, 1987, 62-282806; Dec. 17, 1987, 62-319533

Int. Cl.[4] H01H *9/32, 71/16, 33/06*

U.S. Cl. 200—151 **10 Claims**



1. A contactor device for a circuit breaker having a pair of external terminals, comprising:

a stationary conductor having a central axis and a surface and a stationary contact mounted on said surface, constituting an electricity path extending from one of the external terminals to said stationary contact;

a movable conductor including a movable contact movable to detachably touch said stationary contact, and constituting an electricity path extending from said movable contact to another of the external terminals;

a stationary ferromagnetic core; fixedly mounted on said stationary conductor with opposing pole portions spaced from each other in a direction transverse the central axis;

an insulative member, coaxially mounted on the stationary conductor, movable between a normal position and an overcurrent position relative the stationary contact, having a portion disposed to substantially cover said stationary contact at times when the insulative member is in the overcurrent position, and spaced away from said stationary contact at times when the insulative member is in the normal position; and

a movable ferromagnetic core fixedly mounted on and movable with the insulative member disposed in a first location spaced from the opposing pole portions at times when the insulative member is in the normal position and a second location adjacent the opposing pole portions at times when the insulative member is in the overcurrent position;

wherein a magnetic flux in said stationary core attracts said movable core to said second location at times when an overcurrent flows in said stationary conductor thereby moving said insulative member to said overcurrent position.

4,880,949

SWITCH DRIVE FOR A ROTARY SWITCH

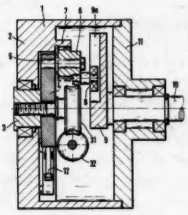
Georg Spinner, Feldkirchen-Westerham; Franz-Xaver Pitschi, Rottach-Egern, and Horst Linnerbauer, Bruckmühl, all of Fed. Rep. of Germany, assignors to Spinner GmbH, Elektrotechnische Fabrik, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,168

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710149

Int. Cl.[4] H01H *3/42*

U.S. Cl. 200—501 8 Claims



1. A switch drive for a rotary switch; comprising:

a casing provided with an internal toothing;

an input shaft supported in said casing;

a lever fixedly connected to said input shaft and supporting a pinion meshing with said internal toothing for transmitting rotation of said input shaft to said pinion;

a switch drive shaft;

transferring means for transmitting movement of said pinion onto said switch drive shaft, wherein said lever is movable between two end positions and is provided with at least one cam; and

contact means directly actuated by said cam in each of said end positions.

4,880,950

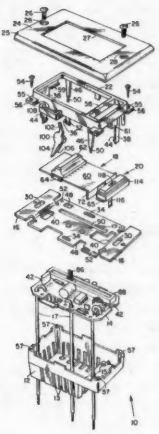
CONTROL SWITCH

Steven R. Carson, Upper Saddle River, N.J.; Raymond T. Griffin, and Scott A. Spear, both of San Antonio, Tex., assignors to Lightolier, Inc., Secaucus, N.J.

Filed Feb. 23, 1988, Ser. No. 160,358

Int. Cl.[4] H01H *15/00;* H01C *10/44*

U.S. Cl. 200—547 9 Claims



9. A control switch comprising:

a frame;

a printed circuit board;

a variable resistor having a sliding contact means, said variable resistor being mounted on said printed circuit board;

a slide arrangement placed within said frame, said slide arrangement comprising:

a slide base;

a slide topper; and

means for slidably connecting said slide topper to a front side of said slide base whereby said slide topper essentially rides flat against said slide base, said connecting means being totally concealed when viewed from said front side of said slide base, said connecting means further coupling said slide topper to said variable resistor so that said connecting means moves said sliding contact means on said variable resistor;

a button member for on-off control of an electrical load, said button member placed within said frame, adjacent to said slide arrangement;

a light source attached to said printed circuit board;

an electrical contact switch mounted on said printed circuit board;

circuit means connecting said electrical contact switch to said variable resistor whereby said electrical contact switch changes operative states between enabling and disabling said variable resistor; and

means coupling said button member to said electrical contact switch mounted on said printed circuit board, said coupling means further transmitting light from said light source to said button member, whereby said button member may be located in the dark.

4,880,951

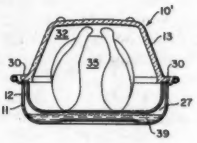
FOOD PREPARATION KIT FOR USE IN COOKING FOOD IN MICROWAVE OVEN OR IN THERMAL OVEN

Melvin L. Levinson, Colonia, N.J., assignor to General Housewares Corporation, Stamford, Conn.

Filed Jun. 3, 1988, Ser. No. 201,606

Int. Cl.[4] H05B *9/06*

U.S. Cl. 219—10.55 E 35 Claims



35. A cooking kit for use in a microwave oven and for use in a thermal oven and on a thermal range, comprising:

(a) an imperforate metal pot having a first base surface, upwardly extending first said walls and a rim at the top of said first side walls; a ceramic coating covering the inner surface of said imperforate metal pot;

(b) a food supporting metal element having a second base surface; a plurality of perforations in the said second base surface, said perforations being of such size as to permit the flow of gas and liquids through the perforations but to preclude or substantially minimize passage of microwaves through the perforations;

(c) a cover having a microwave-transmissive region and being engageable with the said rim of said imperforate metal pot;

said food-supporting metal element being of such size to fit within said imperforate metal pot; support means for supporting the said second base surface above the said first base surface; whereby the second base surface and the said first base surface define a shielded space substantially entirely surrounded by metal and perforated metal from which microwave energy is substantially excluded;

a vapor-confining food cooking chamber below said cover and above the said second base surface.

4,880,952

HEAT COOKING OVEN HAVING FLAT HEATER UNITS ON THE OUTSIDE OF THE WALLS THEREOF

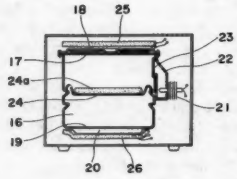
Kazumi Hirai, Nabari; Mitsuo Akiyoshi, Nara; Yoshio Mitsumoto, Kashihara, and Ichiroh Hori, Yamatokoriyama, all of Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 251,951, Sep. 29, 1988, abandoned, which is a continuation of Ser. No. 71,528, Jul. 8, 1987, abandoned, which is a continuation of Ser. No. 853,219, Apr. 17, 1986, abandoned. This application Mar. 24, 1989, Ser. No. 328,772

Claims priority, application Japan, Apr. 17, 1985, 60-81666; Apr. 30, 1985, 60-93046; May 14, 1985, 60-101852

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 B 2 Claims



1. A heat cooking apparatus comprising:

a heating chamber for accommodating food material to be heated therein and having a front opening and metal walls defining all but one of the remainder of the walls of said heating chamber, said metal walls each having an outwardly turned flange along the edge thereof at the location of said one wall of the chamber;

a heater carrying wall constituting said one wall of said chamber and having the peripheral edge engaged with the flanges of the said metal walls, said heater carrying wall being of metal and having a layer of black non-metallic self-cleaning material which has a high heat emissivity of at least 0.5 coated thereon on the surface thereof facing the interior of said heating chamber;

a flat heater unit on the side of said heater carrying wall facing away from the interior of said heating chamber, said heater unit having a plurality of thin sheets of an electric insulator material having good heat resistance at the temperatures necessary for cooking food within said heating chamber, one of said sheets being positioned on the side of said heater unit toward said heater carrying wall and a resistance heater constituted by at least one heating wire on the side of said one sheet away from said heater carrying wall, the heating wire being mounted between said thin sheets for giving the heater unit a flat shape;

a retainer plate over the thin sheet remote from said heater carrying wall and having flanges overlying the edge of said heater carrying wall which is against the flanges of said metal walls;

fastening means fastening said flanges on said metal walls, the edge of said heater carrying wall and said flanges on said retainer plate together for mounting said heater carrying wall on said metal walls to complete said heating chamber and for holding said retainer plate firmly against said flat heater unit to hold said flat heater unit against said heater carrying wall; and

means for supplying microwave radiation into said heating chamber.

4,880,953

METHOD OF RECHARGING A HEAT PACK BY MICROWAVE ENERGY

Charles F. Manker, Chicago, Ill., assignor to Prism Technologies, Inc., Chicago, Ill.

Filed Dec. 23, 1988, Ser. No. 289,559

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 M 3 Claims

1. In the method of recharging a flexible plastic pouch heat pack characterized by a sealed flexible plastic pouch which contains a supercoolable aqueous salt solution in its substantially crystallized solid form and a free-floating metallic activator for initiating crystallization, said pouch having no internal welds between opposing sides of said pouch which define confined spaces that are capable of significantly impeding movement of said activator or the movement of solution within the pouch when the solution is in at least partially liquid form thereby impeding the transfer of heat within the liquid and melting solid during recharging, the step of contacting said pack with a source of microwave energy sufficient to raise the temperature of said solution to the point at which it changes from a substantially solid phase to a liquid phase.

4,880,954

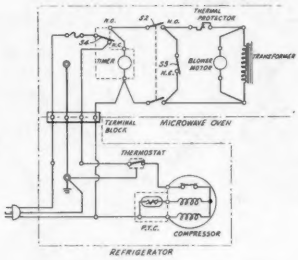
COMBINED REFRIGERATOR AND MICROWAVE OVEN WITH TIMED OVERLOAD PROTECTION

Robert P. Bennett, 49 Francis Wyman Rd., Burlington, Mass. 01803, and Kunimitsu Ozaki, 721 Mikan Dr., Richmond, Ind. 47374

Filed Jun. 3, 1988, Ser. No. 201,903

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 M 3 Claims



1. In a method of operating a compressor of a refrigerator and a magnetron of a microwave oven, said refrigerator and microwave oven being combined in a single cabinet, the improvement comprising the steps of:

providing said microwave oven with manually settable means for timing supply of operating power to said magnetron for different, selectable periods of time;

setting said timing means according to each desired period of operation of said magnetron;

starting and operating said timing means according to said setting; and

preventing operation of said refrigerator compressor by and during said operating of said timing means.

4,880,955

BAKING OVEN HAVING A LIGHTING DEVICE WITH A LOW VOLTAGE AND/OR HALOGEN BULB

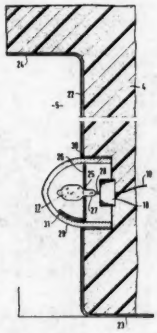
Karl Nitzinger, Traunreut; Josef Gerl, Palling; Herbert Steiner, Traunstein, and Helmut Hess, Traunreut, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,930

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643371

Int. Cl.[4] H05B *6/64*; F21V *33/00*

U.S. Cl. 219—10.55 R **21 Claims**



1. Baking oven, comprising an electrical cooking device operating on normal household voltage, at least one boundary wall defining a baking space, at least one lighting device each including a first part in the form of a 12 volt halogen bulb, a second part in the form of an electrical connection for said bulb, and a lamp socket disposed on said at least one boundary wall having means for receiving said bulb in said lamp socket from inside said baking space with said bulb protruding substantially completely into said baking space, said boundary wall having an opening formed therein for receiving and closely surrounding one of said parts of said lighting device.

4,880,956

DEVICE FOR RADIAL MACHINING AND WELDING ELEMENT

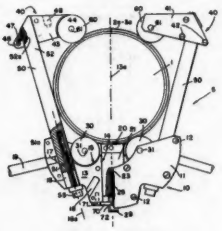
Pierre Mazoyer, Chanoz Chatenay, France, assignor to Orbital Sarl, Meximieux, France

Filed Sep. 23, 1987, Ser. No. 100,320

Claims priority, application France, Sep. 24, 1986, 86 13634

Int. Cl.[4] B23K *9/225*

U.S. Cl. 219—60 A **17 Claims**



1. A device for radial machining a tubular body comprising:

a tool support adapted and configured to be placed around said tubular body;

said tool support driven in rotation around said tubular body;

said support comprising four rollers;

said support comprising a main body having an axis of symmetry and a central part;

an opening in the central part thereof for receiving a tool;

two guide rollers fastened to said main body, each guide roller being placed on one side of the axis of symmetry;

two guide carriages;

a guide roller mounted on each guide carriage;

means for modifying the position of said guide carriages in relation to said main body as a function of the diameter of said tubular body;

wherein each of said guide rollers is provided with a groove, each groove determining two elastic wings;

each guide roller adapted and configured to be placed onto lips on said tubular body with elastic deformation of said wings, and to be centered on a joint face of said tubular body.

4,880,957

WIRE-CUT ELECTRICAL DISCHARGE MACHINE WITH ELECTRIC SHOCK PREVENTER

Toshiyuki Aso, Hino, and Hiroshi Hosoda, Hachioji, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

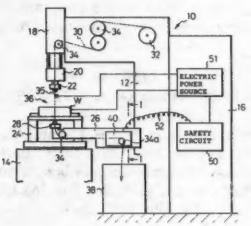
PCT No. PCT/JP88/00338, § 371 Date Nov. 29, 1988, § 102(e) Date Nov. 29, 1988, PCT Pub. No. WO88/07429, PCT Pub. Date Oct. 6, 1988

PCT Filed Apr. 1, 1988, Ser. No. 298,606

Claims priority, application Japan, Apr. 2, 1987, 62-79667

Int. Cl.[4] B23H *7/04*

U.S. Cl. 219—69.12 **3 Claims**



1. A wire-cut electrical discharge machine having a means for preventing an accident due to an electric shock, wherein said machine guides an electrode wire which is fed from an electrode wire supply reel, and to which an electric power is supplied from an electric power source via an electric power supply member, and runs to an electrode wire collection section through an electrospark machining area in which a workpiece is machined by an electrospark between the workpiece and the electrode wire, to the electrode wire collection section by means of a roller device disposed just before the electrode wire collection section, said means comprising:

a safety circuit for stopping an electric power supply from said electric power source by a current signal;

a conductive base plate made of a conductive material supporting said roller device;

an insulating layer disposed between and electrically insulating said conductive base plate and a machine body of said wire-cut electrical discharge machine to which said conductive base plate is attached; and

a lead wire for leading a current leaking from said electrode wire to said conductive base plate, to said safety circuit.

4,880,958

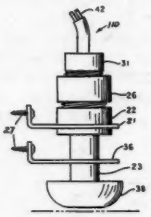
TORCH SUPPORT FOR PLASMA CUTTING SYSTEM

James A. Conley, Meadville, Pa.

Continuation of Ser. No. 042,058, Apr. 24, 1987, Pat. No. 479,265, and a continuation-in-part of Ser. No. 895,495, Aug. 11, 1986, abandoned, which is a continuation of Ser. No. 713,045, Mar. 8, 1985, Pat. No. 4,633,055. This application Aug. 1, 1988, Ser. No. 226,449

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.39 12 Claims



1. A support for a plasma cutting torch comprising an upper bracket bearing and a torch tube,

said torch tube having a torch bearing fixed in its lower end,

a torch having a sleeve along a portion of its length,

said sleeve being slidably received in said torch tube,

said torch resting on said torch bearing,

lower bracket bearing adapted to be attached to a plasma cutting system and shoulder on said upper bracket bearing supporting said torch tube,

said torch having a tip,

a ski cup on the lower end of said torch tube adapted to be moved over work supported on said plasma cutting system whereby said tip of said torch is maintained in a predetermined r lation to work supported on said system.

4,880,959

PROCESS FOR INTERCONNECTING THIN-FILM ELECTRICAL CIRCUITS

Thomas H. Baum, San Jose; Paul B. Comita, Menlo Park, and Robert L. Jackson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1988, Ser. No. 263,103

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.85 7 Claims

1. A process for interconnecting thin-film electrical circuits, said process comprising the steps of: (a) partially ablating the metallurgy at the interconnection points by means of a pulsed laser, and (b) depositing metal to form an interconnection of the desired dimensions.

4,880,960

CONTINUOUS VACUUM EVAPORATION DEVICE FOR METAL

Olivier Remondiere, Ramonville St Agne; Patrick Bourquin, Merignac, and René Pailler, Cestas, all of France, assignors to Centre National d'Etudes Spatiales, Paris, France

Filed Mar. 7, 1988, Ser. No. 165,079

Claims priority, application France, Mar. 6, 1987, 87 03092

Int. Cl.[4] C23C *14/26*

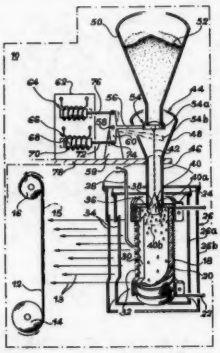
U.S. Cl. 219—273 7 Claims

1. Apparatus for evaporation of a metal in a vacuum chamber, said apparatus comprising:

a crucible wherein the crucible includes in one of its walls, at least one evaporation opening having dimensions that are sufficiently small so that metal particles in the crucible cannot escape, said evaporation opening comprises a window closed by a screen, said screen having a mesh with dimensions that are sufficiently small so that the metal particles in the crucible cannot pass through said mesh;

means for introducing metal particles into the crucible wherein said means for introducing comprises a supply opening, different from said evaporation opening, located in a wall of the crucible and means for at least partially sealing said supply opening during a specified length of time, said means for at least partially sealing said supply opening comprises a valve movable between a closed position in which it seals the supply opening of said crucible and an open position;

wherein said means for introducing the metal into the crucible comprises;



a reservoir located a distance from said crucible and having an opening allowing passage of said metal particles;

means for guiding the metal particles from said reservoir to said crucible;

a closure means movable between a closed position in which it closes said reservoir opening and an open position in which it does not close said reservoir opening; and

means for controlling the opening and closing of said valve and said closure means; and

means for causing evaporation of the metal particles in the crucible.

4,880,961

APPARATUS FOR HEATING YARN

James E. Duncan, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1988, Ser. No. 162,965

Int. Cl.[4] H05B *3/42*

U.S. Cl. 219—388 8 Claims

8. A yarn heating element for use with an apparatus for drawing nylon yarn that includes at least one rotating feed roll and at least one rotating draw roll mounted on a frame for

conveying the yarn at a yarn velocity, said draw roll having a surface speed higher than the surface speed of the feed roll to draw yarn conveyed from said feed roll to said draw roll, said yarn heating element being positioned to contact said yarn after leaving said feed roll and before contacting said draw roll to heat said yarn as it is drawn, said yarn heating element comprising: an elongated cylindrical core connected at one of its ends to said frame, said core having a central bore therein; an elongated electrical heater positioned in said bore; a sleeve mounted rotatably to said core, said sleeve being telescoped over said core defining a concentric space between said sleeve and said core, means for rotating said sleeve at a surface velocity less than the yarn velocity and means for energizing said heater, said yarn heating element further comprising: said sleeve having an inside diameter that varies along its length whereby the width of said concentric space varies along the length of the heating element to vary the temperature profile of the sleeve along its length.

4,880,962

ELECTRICAL DEVICE

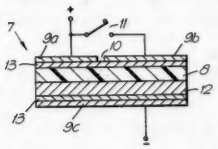
Jean-Marie E. Nolf; Jan L. M. F. G. Vansant, both of Korbeek-Lo, Belgium, and Michael L. Jensen, Cary, N.C., assignors to Raychem Corporation, Menlo Park, Calif.

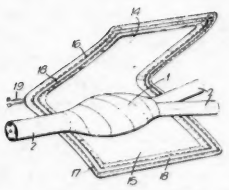
Filed Feb. 24, 1988, Ser. No. 160,055

Claims priority, application United Kingdom, Feb. 24, 1987, 8704232

Int. Cl.[4] H05B *3/36*

U.S. Cl. 219—549 **7 Claims**





1. An electrical heater in strip form, which comprises:
(a) a conductive strip heating element comprising a conductive polymer composition;
(b) a first electrode in strip form lying on a first surface of said strip and running along said strip;
(c) a second electrode in strip form lying on said first surface of said strip and running along said strip, said second electrode being spaced apart from said first electrode;
(d) a third electrode lying on a second surface of said strip opposite said first surface and running along said strip;
(e) means by which the first and second electrodes can be connected together;
(f) means by which the first and/or second electrodes can be connected to a first polarity of a source of electrical power; and
(g) means by which said third electrode can be connected to a second polarity of said source of electrical power;

the electrical widths of the first electrode being from 30-50% of the electrical width of the third electrode.

4,880,963

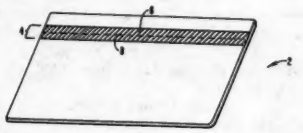
ENCODING MAGNETIC CARDS

Toshihiko Yamashita, The Third Industry Co. Ltd., 4-43, 2-Chome, Shibata Kita-Ku, Osaka, Japan

Filed Nov. 13, 1987, Ser. No. 120,279

Int. Cl.[4] G06K *7/08*

U.S. Cl. 235—449 **7 Claims**



1. A system for encoding information on a magnetisable substrate, in which said substrate has first and second parallel tracks, on said first track, binary information is encoded with shorter spaces between changes of field representing one of the two binary digits and longer spaces representing the other of the two binary digits, and said second track is encoded with binary information in such a way that any change of field substantially coincides with a change of field in the first track and one digit of the binary pair is represented by no change in field on the second track as the field changes on the first track whilst the other binary digit is represented by a change of field on the second track coincidentally with a change of field on the first track.

4,880,964

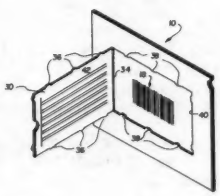
SCANNABLE FRAUD PREVENTING COUPON

Patrick J. Donahue, Bell Mead, N.J., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Jun. 14, 1984, Ser. No. 620,741

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—462 **16 Claims**



1. An optically scannable fraud preventing coupon or the like, comprising:
(a) a first panel having a plurality of parallel bars providing a first coded optically scannable image on a first surface thereof;
(b) a second panel secured to said first panel and including at least a portion thereof overlying said first coded scannable image;
(c) said first coded scannable image being scannable through said first and second panels;
(d) a series of parallel lines providing a second coded optically scannable image scannable through said first and second panels is disposed on said at least a portion of said second panel juxtaposed to said first image and the lines of said second image are angularly disposed relative to said bars for altering said first coded scannable image by creating a composite scanning image preventing scanning of

said first coded scannable image through said secured together first and second panels;

(e) means for indicating removal of said at least a portion of said second panel from overlying relation with said first coded scannable image; and,

(f) means for removing said overlying at least a portion of said second panel to thereby permit scanning of said first coded scannable image.

4,880,965

X-RAY IMAGE INTENSIFIER HAVING VARIABLE-SIZE FLUORESCENT CRYSTALS

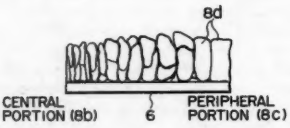
Hiroshi Kubo, and Atsuya Yoshida, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1988, Ser. No. 167,245

Claims priority, application Japan, Mar. 13, 1987, 62-56741; Dec. 11, 1987, 62-311870

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **10 Claims**



1. An X-ray image intensifier comprising:

a vacuum envelope having an input window for receiving X-rays;

an input fluorescent screen having a peripheral portion and a central portion, for converting X-rays received through said input window into light, said peripheral portion of said input fluorescent screen having a larger light transmission coefficient than said central portion;

a photoelectric layer for converting the light into electrons;

electrode means constituting an electron lens for accelerating and converging the electrons; and

an output fluorescent screen for converting the electrons, which were accelerated and converged by said electron lens, into a visible image.

4,880,966

TACHOMETER SENSOR USING A LENS SYSTEM TO A IN SENSING THE ROTATIONAL SPEED OF AN OBJECT

Jeffrey A. Goodrich; Charles M. Poe, Jr., and Jeffrey A. Prsha, all of San Diego, Calif., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Apr. 8, 1988, Ser. No. 179,644

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 R **20 Claims**

1. A tachometer sensor for sensing rotational speed of an object, comprising:

(a) a light emitting device for illuminating the object;

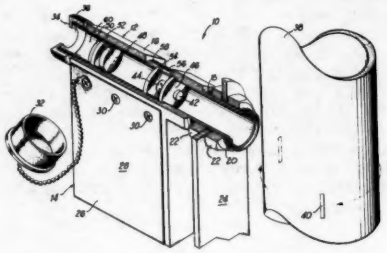
(b) at least one reflective mark on the object for reflecting light rays emitted by the light emitting device;

(c) an objective lens located in the path of the light rays emitted by the light emitting device and reflected by the mark;

(d) a beam splitter located in the path of light rays reflected by the objective lens and oriented substantially perpendicular to that ray-path, for reflecting a first portion of the rays in a direction substantially opposite and parallel to that in which the first portion of rays strikes the beam splitter and for allowing a second portion of the rays to pass through;

(e) a photoelectric sensor located at substantially the focal point of the first portion of the light rays reflected by the objective lens and reflected by the beam splitting means;

(f) an ocular lens located in the path of the second portion of light rays reflected by the objective lens and penetrating the beam splitting means, for aligning the second portion of rays so that one using the sensor can view the mark on the rotating object through the sensor in order to align the sensor;



(g) driver means for supplying power to the light emitting device; and

(h) circuit means for conditioning and providing for output the signals produced by the photoelectric sensor.

4,880,967

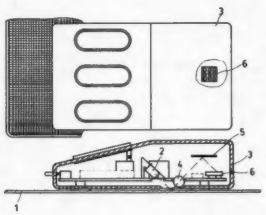
COORDINATE VECTOR METHOD FOR OPTICAL INPUT DEVICE

Fong Kwang-Chien, 3F-2 No. 3, Alley 6, Lane 118, Sec. 1, Chung Yang Road, Tu Cheng Hsiang, Taipei, Hsien, Taiwan

Continuation of Ser. No. 67,534, Jun. 29, 1987, abandoned. This application Apr. 25, 1989, Ser. No. 344,522

Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—221 **3 Claims**



1. An optical input device for a cursor or the like based on the coordinate vector method comprising:

a moveable light source, a coordinate plane having a grid thereon and a matrix of light sensitive units adapted to be coupled to a central processing unit said grid having a predetermined pitch of equal spacing both in the horizontal direction and perpendicular thereto each line in said grid having a predetermined width, said matrix having light sensitive units of a predetermined dimension horizontally and perpendicular thereto and a predetermined separation distance, the dimension and distance being related to the pitch and line width of the grid;

means for directing the light source onto the plane and for projecting a grid image;

magnifying means and reflecting means for magnifying the image and directing it onto the matrix, said grid being dimensioned relative to the matrix so that each light sensitive unit will emit either a high or a low signal depending on the intensity of the light striking it the relationship between the dimension and distance between light sensitive units and the pitch and line width of the grid in the

image being such that all light sensitive units never emit either a high or a low signal at any position of said light source relative to said grid so that the signals emitted can be interpreted by a central processing to calculate distance and direction as the light source moves across said plane.

4,880,968

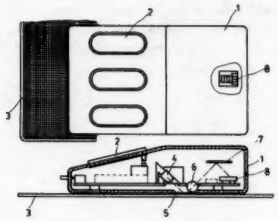
OPTICAL INPUT CURSOR DEVICE USING OPTICAL GRID MEANS

Fong Kwang-Chien, 3F-2 No. 3, Alley 6, Lane 118, Sec. 1, Chung Yang Road, Tu Cheng Hsiang, Taipei Hsien, Taiwan

Continuation of Ser. No. 64,250, Jun. 19, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 328,731

Int. Cl.[4] G09G *3/02*

U.S. Cl. 250—221 **1 Claim**



1. An optical cursor control comprising:

a reflection plane with parallel lines of constant width and pitch on its surface in horizontal and perpendicular directions of a definite ratio to reflect light;

a light source, lens, reflector and receiver to transmit light in the form of an image to the said reflection plane and reflect light therefrom, amplify it and transmit it, said receiver adapted to receive the image from said reflector, said receiver having a plurality of mutually spaced optical grids disposed in horizontal and perpendicular directions, each of the optical grids having a wafer in the bottom thereof to give corresponding High and Low output signals upon receipt of bright light and shadow the image covering all grids and defining 3/2 of the pitch in the horizontal and perpendicular directions the optical grids on said receiver in a horizontal direction adapted to provide an electronic signal in response to change of light from horizontal displacement of the light source, and the optical grids on said receiver in a perpendicular direction adapted to provide an electronic signal in response to change of light from perpendicular displacement of the light source on the reflection plane; and

electronic signal processing means for receiving signals from said grids and amplifying, rectifying and computing to determine distance and direction of displacement and for controlling movement of a cursor responsive thereto.

4,880,969

OPTICAL TOUCH PANEL WITH HEAT SINK

George S. Lawrie, Mississauga, Canada, assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 858,364, Apr. 30, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 198,284

Int. Cl.[4] G09G *1/00*; G01V *9/04*

U.S. Cl. 250—221 **14 Claims**

1. A programmable touch panel, comprising:

a plurality of keyswitches for entry of data, each keyswitch comprising;

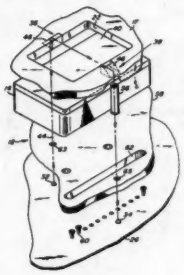
a light source for providing a light beam along a first optical path;

first means for reflecting the light beam so that the light beam traverses a second optical path;

second means for reflecting the light beam so that the light beam traverses a third optical path generally parallel to the first optical path and opposite in direction thereto; and

detector means for producing a detector signal in response to light traversing the third optical path;

a display module for displaying information input via the keyswitches;



a printed circuit board upon which the plurality of keyswitches and the display module are mounted; and

a heat sink adjacent the printed circuit board, the heat sink including a plurality of openings therethrough such that the first and third optical paths for each keyswitch pass through corresponding openings in the heat sink.

4,880,970

OPTICAL SENSORS FOR MEASUREMENT OF A VARIABLE PARAMETER

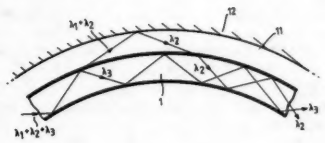
Gordon R. Jones, 17 Brimstage Close, Heswall, Wirral, Merseyside, England

Filed Feb. 22, 1988, Ser. No. 158,668

Claims priority, application United Kingdom, Feb. 26, 1987, 8704540

Int. Cl.[4] H01J *5/16*, *40/14*

U.S. Cl. 250—227 **8 Claims**



1. Apparatus for measuring a parameter comprising a polychromatic light source; a detector; an optical fibre situated so as to transmit polychromatic light from the source to the detector, the optical fibre being disposed such that a change in the parameter to be measured causes a movement of the fibre to vary the amount of microbending such that the portion of the polychromatic light which is no longer constrained within the optical fibre is varied, there being provided a member against which at least a portion of the optical fibre is urged by a change in the parameter to be measured; and analysis means for interpreting the output of the detector in terms of the parameter to be measured, the detector comprising at least first and second photo-responsive elements, the responsivity with respect to wavelength of the first element being different from that of the second, and means for supplying signals from the photo-responsive elements to the analysis means, the analysis means including means for calculating, from the signals from

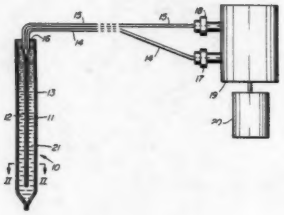
the phot-responsive elements, the color of the polychromatic light transmitted by the optical fibre as represented by two or more parameters on the Chromaticity (CIE) Diagram.

4,880,971

FIBER OPTIC LIQUID LEVEL SENSOR

Lee A. Danisch, 422 Northumberland Street, Fredericton, New Brunswick, Canada E3B 3K4

Filed Feb. 17, 1988, Ser. No. 156,660
Int. Cl.[4] H01J *5/16*; G01F *23/00*
U.S. Cl. 250—227 **14 Claims**



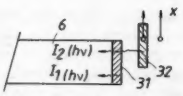
1. A liquid level sensor comprising:
an elongate housing having at least part of its periphery of light transmitting material;
an elongate light emitter and an elongate light collector extending side-by-side in said housing;
a light transmitting medium in the housing and surrounding said emitter and said collector;
means for feeding light to the emitter and means for feeding light from the collector;
the index of refraction of said light transmitting medium being less than the index of refraction of said light transmitting material of said housing; and
the index of refraction of said light transmitting medium being one of less than or equal to the index of refraction of the liquid the level of which is being sensed.

4,880,972

FIBER-OPTIC MEASURING APPARATUS USING LUMINESCENT MATERIAL

Torgny Brogardh, and Christer Ovren, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 550,731, Nov. 14, 1983, which is a continuation of Ser. No. 218,949, Dec. 22, 1980. This application Mar. 4, 1985, Ser. No. 708,095
Claims priority, application Sweden, Dec. 28, 1979, 7910715
Int. Cl.[4] G01P *1/00*; G01N *21/64*; G02B *5/14*
U.S. Cl. 250—231 R **4 Claims**



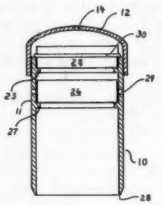
1. Fiber-optic measuring apparatus for measuring physical characteristics of an object, comprising:
a first member with at least one photoluminescent material and generating a first optical output signal from light emitted from said at least one photoluminescent material;
a second member with at least one another photoluminescent material and generating a second optical output signal from light emitted therefrom;
electrical processing means including light source means for generating light to be radiated onto said first and second members and means responsive to said first and second optical output signals to produce respective first and second electrical signals representative thereof, the spectral distribution of said light source means including the excitation spectra of said first and second photoluminescent materials;
at least one optical fiber for conducting light generated by said light source means to said first and second members and for conducting said first and second optical output signals to said responsive means;
at least one of said first and second photoluminescent materials emitting said first or second optical output signal such that the intensity thereof is a measuring signal representative of the relative movement of said first and second members in accordance with the variation in the characteristic of the object being measured, the other of said first or second output optical signal being a reference signal; and
said electronic processing means further including means responsive to said first and second electrical signals for producing an output signal representative of the characteristic being measured.

4,880,973

GROUND RADON FLUX SAMPLING DEVICE

John D. Reynolds, Star Route, Box 124, Topping, Va. 23169

Filed Jul. 15, 1988, Ser. No. 219,632
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—253 **12 Claims**



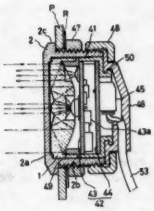
1. A radon sampling apparatus for measurement of radon gas emanating from the ground by adsorption of said radon gas on an adsorption medium within a canister, said apparatus comprising:
holder means having a sidewall for defining an internal region, said holder means having a first opening disposed in its top end and a second opening disposed in its bottom end for admission of said radon gas into said internal region, said canister being at least partially insertable into said holder means proximate said top end of said holder means;
a cap for capping said first opening, said cap having a vent opening therein;
first retainer means formed on said sidewall of said holder means for retaining said canister therein;
second retainer means formed on said sidewall of said holder means for retaining a replaceable filter means and in said internal region below said canister; and,
venting means formed in said sidewall of said holder means to provide communication between said internal region and ambient atmosphere through said filter means.

4,880,974

PHOTOELECTRIC SENSOR EMPLOYING CUSTOM LENS MEMBER

Masami Yamakawa, Yokohama, Japan, assignor to Wako Corporation, Kanagawa, Japan

Filed Oct. 14, 1988, Ser. No. 258,197
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 10 Claims



1. In a photoelectric sensor comprising: a connecting cylinder for connecting an optical body integrally to a circuit block disposed therebehind; a transparent resinous casing for incorporating therein said optical body and said circuit block interconnected with each other; an electric wire connector disposed on an outer surface of said circuit block; and a cover body for covering a rear opening of said transparent resinous casing for incorporating therein all aforesaid components,

said optical body being made of a transparent resinous material and having a nearly crescent-shaped section, one surface of said optical body being formed as a circular objective surface, while the other surface thereof being formed as a circular convex surface;

said circular objective surface being, on a central part thereof, provided with a first recess having a concave bottom surface of a diameter one-third smaller than said circular convex surface and a convex protrusion as an objective lens;

said circular convex surface being, upon a central part thereof, provided with a second recess having a convex bottom surface of a slightly smaller diameter than said concave bottom surface as a collective lens means so as to oppose to said first recess;

said concave bottom surface in said first recess excluding said convex protrusion being formed as a second reflective surface by a vacuum evaporating plating means;

said circular convex surface excluding said second recess being formed as a first reflective surface by a vacuum evaporating plating means and being, on its circumference, provided with a skirt means;

said first reflective surface being, on a surface thereof, provided with an opening to transmit a luminous flux of a motion indicating lamp toward said circular objective surface;

said circuit block being, on a front surface thereof, provided with a photoelectric converting element and said motion indicating lamp, while, on both surfaces thereof, provided with a circuit substrate and a terminal substrate.

4,880,975

FINE ADJUSTMENT MECHANISM FOR A SCANNING TUNNELING MICROSCOPE

Tadashi Nishioka; Takao Yasue, and Hiroshi Koyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 9, 1988, Ser. No. 229,981
Claims priority, application Japan, Apr. 22, 1988, 63-98230
Int. Cl.[4] H01J *37/04*
U.S. Cl. 250—306 14 Claims

1. A fine adjustment mechanism for use in a scanning tunneling microscope, comprising:

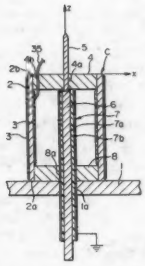
a mounting member;

a cylindrical piezoelectric element fixed to said mounting member at one end thereof;

an electrode means provided on each of the inner and outer walls of said piezoelectric element;

a probe provided on the other end of said piezoelectric element in such a manner that said probe extends outwardly on the central axis of said piezoelectric element;

an electrically conductive member provided on the central



axis of said piezoelectric element, one end of said conductive member being electrically connected to said probe within said piezoelectric element and the other end thereof extending to the outside of said piezoelectric element through the side of said piezoelectric element at which said piezoelectric element is fixed to said mounting member; and

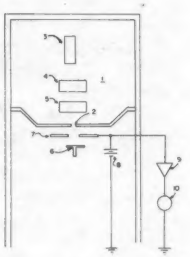
a shielding means provided on the outer periphery of said conductive means for electrically shielding said conductive means.

4,880,976

SECONDARY ELECTRON DETECTOR FOR USE IN A GASEOUS ATMOSPHERE

James F. Mancuso, Rowley; William B. Maxwell, Dracut, both of Mass., and Gerasimos D. Danilatos, North Bondi, Australia, assignors to ElectroScan Corporation, Danvers, Mass.

Continuation of Ser. No. 52,700, May 21, 1987, Pat. No. 4,785,182. This application Nov. 10, 1988, Ser. No. 269,635
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] H01J *37/252*
U.S. Cl. 250—310 1 Claim



1. A device for generating, amplifying and detecting secondary electrons from a surface of a sample which comprises:

(a) a vacuum envelope having a pressure limiting aperture;

(b) a charged particle beam source located within the vacuum envelope and capable of emitting a charged particle beam;

(c) focusing means located within the vacuum envelope and capable of directing a charged particle beam emitted by the charged particle beam source through the pressure limiting aperture;

(d) sample platform means, disposed outside the vacuum envelope, capable of maintaining a sample enveloped in gas in registration with the pressure limiting aperture such that a surface of the sample may be exposed to a charged particle beam emitted from the charged particle beam source and directed through the pressure limiting aperture;

(e) an electrode positioned within between about 1 and about 200 mm from the sample platform means such that secondary electrons emitted from a surface of a sample located on the sample platform means and exposed to a charged particle beam emitted from the charged particle bean source may come into contact with it;

(f) a voltage source, connected between the electrode and an electrical ground, capable of maintaining an electrical potential difference between the electrode and the sample platform means of greater than about 50 volts and less than about 2000 volts, the electrode potential being of a predetermined magnitude relative to the sample platform means potential so as to accelerate secondary electrons emitted from a surface of a sample located on the sample platform means with an electric field of sufficient strength so as to cause emitted secondary electrons to collide with gas molecules and produce negative charge carriers which can subsequently produce additional negative charge carriers through multiple collisions with other gas molecules resulting in a number of negative charge carriers greater than and proportional to the number of original secondary electrons, the strength of the electric field being sufficiently low so as to avoid catastrophic electrical discharging or arcing;

(g) a current amplifier operatively connected within the device to amplify the secondary electrons; and

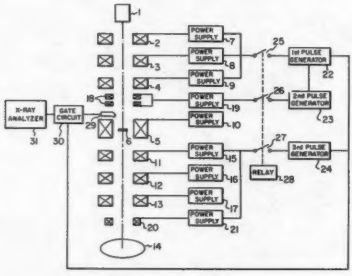
(h) current detection means connected between the current amplifier and an electrical ground.

4,880,977

ANALYTICAL ELECTRON MICROSCOPE

Ken Tomita, and Seiichiro Mori, both of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,458
Claims priority, application Japan, May 28, 1987, 62-133073
Int. Cl.[4] H01J *37/26*
U.S. Cl. 205—311 **7 Claims**



1. An analytical electron microscope comprising:

an electron gun for producing an electron beam;

a condenser lens means for directing the electron beam onto a specimen;

an imaging lens means for projecting an image of the specimen onto a fluorescent screen; and

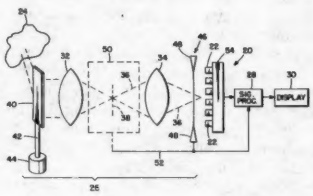
a control means which causes the condenser lens means to switch back and forth between a first operation mode, in which the focusing lens means finely focuses the beam irradiating on the specimen such that a bright spot appears on the fluorescent screen, and a second operation mode in which the focusing lens means defocuses the beam irradiating on the specimen such that a transmission electron microscope image appears on the fluorescent screen, the electron beam being switched between the two states at intervals shorter than the persistance time of the fluorescent screen whereby the location of the finely focussed beam appears as a bright spot upon the transmission electron microscope image enabling the positioning of the finely focussed beam upon a feature of the specimen represented by the image.

4,880,978

RESONANT RADIATION PROTECTOR

David B. Cohn, Torrance, and Gregory R. Sasaki, Long Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 25, 1988, Ser. No. 275,878
Int. Cl.[4] H01L *25/00*
U.S. Cl. 250—332 **14 Claims**



12. An imaging system comprising an array of detectors for viewing scene radiation emitted by a scene;

focusing optics for directing rays of the scene radiation to image upon said array of detectors;

means coupled to output terminals of said detectors for combining signals of said detectors to provide an image of said scene;

shutter means optically coupled to said focusing optics for protection of said detectors from laser radiation lying within a frequency band of the scene radiation, said shutter means terminating propagation of said laser radiation from said focusing optics to said array of detectors;

a cell having windows transparent to the scene radiation;

lasing material disposed within said cell, said focusing optics directing rays of said scene radiation and rays of said laser radiation along a path through said windows;

electrode means including electrodes for converting said laser radiation to fluorescent radiation; and

a further detector offset from said radiation path for detecting said fluorescent radiation, an output signal of said fluorescent detector being connected to said shutter means for activating said shutter means to terminate propagation of said laser radiation to said array of detectors.

4,880,979

INFRARED RAY DETECTOR

Yasuaki Yoshida, Itami, Japan, assignor to Mitisubishi Denki Kabushiki Kaisha, Japan

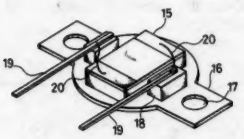
Filed Feb. 23, 1988, Ser. No. 158,735
Claims priority, application Japan, Feb. 27, 1987, 62-45635
Int. Cl.[4] G01J *5/20*
U.S. Cl. 250—338.4 **10 Claims**

1. An infrared detector comprising:

a semiconductor infrared ray detection element disposed on a high resistivity substrate for generating an electrical

signal at a pair of electrical terminals in response to incident infrared rays; and

a metal submount including a metal plate, two electrical lead terminals electrically insulated from each other and from said plate, said plate containing at least one hole for provi-



sionally mounting the submount on a dewar with a fastener passing through the hole, wherein said element is soldered to said plate and the electrical terminals of said element are respectively electrically connected to the lead terminals of said submount.

4,880,980

INTRUSION DETECTOR

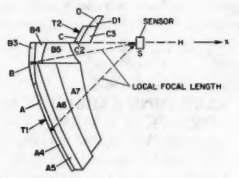
Kurt Müller, Stäfa, and Hansjürg Mahler, Hombrechtikon, both of Switzerland, assignors to Cerberus AG, Switzerland

Filed Aug. 10, 1988, Ser. No. 230,795

Claims priority, application Switzerland, Aug. 11, 1987, 3083/87

Int. Cl.[4] G01J *5/08*

U.S. Cl. 250—353 **12 Claims**



1. An intrusion detector comprising at least one infrared sensor and a focusing reflector wherein said reflector comprises a plurality of reflector groups, each group having at least one reflector segment, each of said segments having a focal point at said sensor and said segments being interconnected to form a composite reflector structure each of said segments having an optical axis with a selected vertical and horizontal angular displacement, said vertical and horizontal displacements being selected to focus infrared energy from a corresponding plurality of detector zones in a desired region of protection onto said sensor, said zones being staggered in both horizontal and vertical angular displacement, each of said segments having a focal length approximately inversely proportional to the size of the vertical angular displacement of the corresponding optical axis, each of said reflector groups corresponding to a range of vertical angular displacements, the vertical angular displacements within each group being different for different horizontal angular displacements to uniformly distribute said detector zones within said desired region of protection.

4,880,981

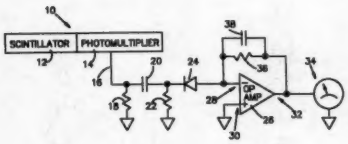
LOW LEVEL RADIATION MEASUREMENT DEVICE

Joseph G. Johnston, Newbury, Ohio, assignor to Bicron Corporation, Newbury, Ohio

Filed Mar. 11, 1988, Ser. No. 166,627

Int. Cl.[4] G01T *1/17*

U.S. Cl. 250—369 **6 Claims**



1. A device for measuring low level environmental radiation, for example in the 0–200 μrem/h or equivalent range, comprising:

a detector on which ionizing radiation can impinge, the detector, in response to impinging radiation events, providing a pulse signal indicative of said detected impinging events as a function of time and indicative of the energy of each of said detected impinging events, said pulse signal including a direct current noise component not caused by said impinging radiation events; and

means for blocking said direct current noise component so as to filter from said pulse signal said direct current noise component, a remaining portion of said pulse signal indicating the average energy fluence of said detected impinging events as a function of time.

4,880,982

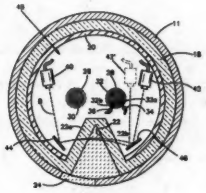
FLUID INDICATOR FOR A CONTAINMENT VESSEL

Harald Hoksaas, Sauda, Norway, assignor to Impex Production & Development A/S (Ltd.), Sauda, Norway

Filed Nov. 17, 1987, Ser. No. 122,049

Int. Cl.[4] G01N *15/06*

U.S. Cl. 250—577 **11 Claims**



1. A fluid indicator for use in a containment vessel, comprising:

a sensor body movable relative to the vessel;

a drive connected to the body for moving it relative to the vessel;

means for indicating the location of the body relative to the vessel;

a passage in the body through which fluid from the vessel can be viewed;

means including a light emitter in the body for directing a beam through said fluid, and

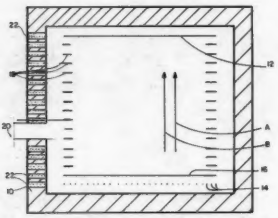
means including a light sensor in the body for detecting the beam after it passes through the fluid and for producing a signal in response thereto.

4,880,983

HIGH PRESSURE XENON IONIZATION DETECTOR

John K. Markey, New Haven, Conn., assignor to Yale University, New Haven, Conn.

Filed Mar. 31, 1988, Ser. No. 175,887
Int. Cl.[4] G01T 1/185; H01J 47/02
U.S. Cl. 250—385.1 10 Claims



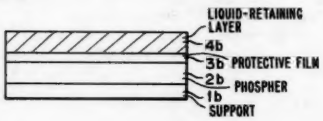
1. A method for detecting ionization comprising allowing particles that cause ionization to contact high pressure xenon maintained at or near its critical point and measuring the amount of ionization of the xenon.

4,880,984

SHEET-FORM RADIATION-MEASURING INSTRUMENT

Hisashi Shiraishi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 614,670, May 29, 1984, abandoned.
This application Jun. 15, 1987, Ser. No. 73,877
Claims priority, application Japan, Jun. 10, 1983, 58-103636
Int. Cl.[4] G01T 1/20
U.S. Cl. 250—484.1 5 Claims



1. A sheet-form radiation measuring instrument means for measuring radioactivity of a liquid sample, said instrument means comprising, in order, a liquid-retaining member having a porous structure, a transparent protective film of synthetic polymer material, and a stimulable phosphor member containing a stimulable phosphor.

4,880,985

DETACHED COLLIMATOR APPARATUS FOR RADIATION THERAPY

Douglas Jones, 11618 - 20th St. Southeast, Everett, Wash. 98205

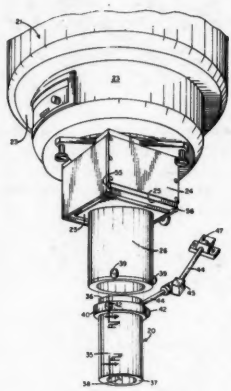
Filed Oct. 5, 1988, Ser. No. 253,597
Int. Cl.[4] H01J 29/46
U.S. Cl. 250—505.1 6 Claims

1. A separated collimator and alignment apparatus for use with linear electron accelerators having a beam output structure supported by a gantry and an associated patient couch movable in three-dimensional space relative to said gantry, comprising, in combination:

an aperture structure defining an orifice for passage of an electron beam therethrough, said aperture structure being releasably carried by an accelerator collimator tube and said orifice being similarly configured to and not larger than an aperture defined in a patient collimator tube;

the patient collimator tube defining a first medial channel for passage of a coherent electron beam and defining a planar input end facing the aperture structure and an exit end distal therefrom;

an annular positioning ring defining a second medial channel to fit about the periphery of the patient collimator tube, said positioning ring defining first means for attachment to a positioning jig mechanism and second means for releasable and adjustable positional maintenance upon the patient collimator tube;



the positioning jig mechanism having at least two rigid rods joined for articulating motion with said first means at a first end to fastenably interconnect with the positioning ring and said second means at a second end for support on a structure external of an electron accelerator to be serviced; and

an elongate alignment rod carried by a base support disk releasably positionable in a first inner accelerator facing end of the patient collimator tube to aid axial alignment of the alignment rod with the patient collimator tube.

4,880,986

SYSTEM FOR MEASURING RADIATION DOSES USING FLUORESCENT DOSEMETERS

Junji Yamada, Yokohama; Yasushi Mawatari, Shizuoka; Toru Ikegami, Shimada; Koichi Nishio; Motoyuki Sato, both of Shizuoka, all of Japan; Bertram Burgkhardt, Karlsruhe, Fed. Rep. of Germany; Ernst Piesch, Eggenstein-Leopoldshafen, Fed. Rep. of Germany, and Siegfried Ugi, Weingarten, Fed. Rep. of Germany, assignors to Toshiba Glass Co., Ltd., Shizuoka, Japan and Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,245
Claims priority, application Japan, Feb. 18, 1988, 63-34073
Int. Cl.[4] G01T 1/06
U.S. Cl. 250—484.1 6 Claims

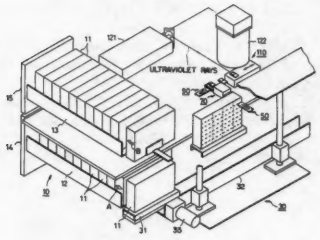
1. A radiation dose measuring system for measuring a radiation dose with an intensity of fluorescent light emitted due to an excitation of a fluorescent glass element on a fluorescent dosemeter which is exposed with a radiation, said system comprising:

a fluorescent dosemeter including a fluorescent glass element having a fluorescent detection surface, a glass holder having an opening through which said fluorescent detection section is subjected to an exposure and holding the fluorescent glass element, and a capsule for holding the glass holder, said capsule comprising an inner case slidably receiving or withdrawing the glass holder and an

outer case slidably receiving the inner case to allow it to be detachably mounted thereon;

at least one magazine capable of receiving a required number of fluorescent dosemeters, said magazine being divided into a predetermined number of segments and the fluorescent dosemeter being adapted to be received in the respective segment;

a magazine conveying device for allowing a predetermined segment of one of magazines fed one by one to be located in a predetermined position;



a fluorescent dosemeter take-out device for taking the fluorescent dosemeter from the segment of the magazine located in a take-out position and for returning it back to the magazine;

a fluorescent glass element setting device which, in the taken fluorescent dosemeter, moves the fluorescent glass element to permit it to be located in a predetermined measuring position; and

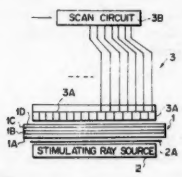
a dose measuring means for subjecting the fluorescent glass element, which is set in a measuring position, to an ultraviolet ray and for measuring an intensity of fluorescent light emitted from the fluorescent glass element excited.

4,880,987

RADIATION IMAGE READ-OUT APPARATUS

Yuichi Hosoi, and Kenji Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 727,988, Apr. 29, 1985, abandoned. This application Jul. 22, 1988, Ser. No. 222,299
Claims priority, application Japan, Apr. 27, 1984, 59-85722
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—484.1 **5 Claims**



1. A radiation image read-out apparatus comprising:

(i) an elongated stimulating ray source (2) for linearly emitting stimulating rays to a stimulable phosphor sheet (1) carrying a radiation image stored therein.

(ii) an elongate photodetector comprising a photoelectric conversion device (3A) axially aligned with and separate from said stimulating ray source and positioned to stand face to face with a portion of said stimulable phosphor sheet exposed to said stimulating rays emitted by said stimulating ray source, said photoelectric conversion device comprising a line sensor (3).

(iii) a wavelength converting phosphor layer (1D) positioned between said line sensor and a stimulable phosphor layer (1B) of said stimulable phosphor sheet, said wavelength converting phosphor layer emitting fluorescent light having a wavelength distribution within a sensitive wavelength range of said line sensor upon reception of light emitted by said stimulable phosphor sheet in proportion to the stored radiation energy when said stimulable phosphor sheet is exposed to said stimulating rays, said fluorescent light impinging upon said line sensor.

(iv) a long wave cut-off filter layer (1C), disposed between said stimulating ray source and said wavelength converting phosphor layer, for enabling read-out of radiation stored in said stimulable phosphor sheet, and

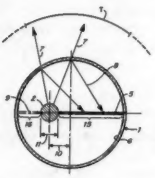
(v) a read-out means (3B) for reading out the output of said line sensor in a line by line manner.

4,880,988

LIGHT AND WEATHERING TESTING APPARATUS

Jürgen Witt, Hainburg, Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,985
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3726803
Int. Cl.[4] G21K *3/00*
U.S. Cl. 250—504 R **19 Claims**



1. Light and weathering testing apparatus having

a radiation source (2) for irradiating a test sample (T), said source emitting light in the ultraviolet (UV), visible and infrared (IR) spectral ranges;

a cylindrical filter (1) defining a cylinder axis (4), surrounding the source (2) and spaced therefrom, said filter (1) being transparent for UV and visible radiation, and reflecting IR radiation; and

IR radiation absorbent means (5) for absorbing said IR radiation reflected from said filter; further comprising, in accordance with the invention,

means for directing substantially all of said reflected IR radiation onto absorbent means (5, 9) located along a single plane, namely a spatial arrangement in which said radiation source is located eccentrically with respect to the cylinder axis (4) of the filter (1), but in a plane which includes the filter cylinder axis (4), said radiation source (2, 3) and said filter cylinder axis (4) thereby defining a reflected-radiation-receiving plane; and

wherein the IR radiation absorbent means (5) extends along said reflected-radiation-receiving plane from an inside wall of the cylindrical filter (1) up to the radiation source (2) part-diametrically across the cylindrical filter (1).

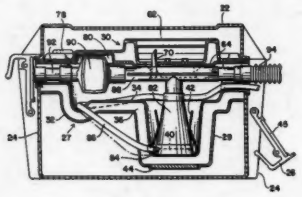
4,880,989
SHIELDING CONTAINER FOR RADIOAEROSOL DELIVERY APPARATUS

Thomas W. Burnett, Bellevue; Thomas R. Clary, Seattle, both of Wash.; Vincent F. Iannuzzelli, Califon, N.J., and Carl P. Kremer, Jr., Darien, Conn., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 817,808, Jan. 10, 1986, Pat. No. 4,782,828, which is a continuation of Ser. No. 477,277, Mar. 21, 1983, abandoned. This application Nov. 18, 1987, Ser. No. 88,427

Int. Cl.[4] G21F *5/00*

U.S. Cl. 250—506.1 **4 Claims**



1. A shielding containing comprising:

an outer shell;

an inner shell supported within said outer shell, said inner shell being formed with an inner wall and outer wall defining a space therebetween for receiving radiation shielding material, said inner wall including means conforming generally to the contours of a radioaerosol source and a transport means for supporting said radioaerosol source and said transport means; and

a removable cover formed with radiation shielding material and including means conforming generally to the contours of the radioaerosol transport means to be positioned thereunder, said inner wall and said cover defining means including at least one opening between them to permit the transport means placed therein to be in fluid communication with the surrounding atmosphere when in use.

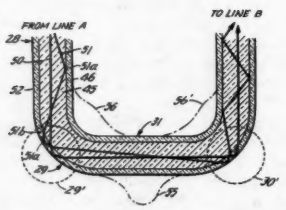
4,880,990
OPTICAL LIQUID-LEVEL SENSING APPARATUS

Joseph D. Rando, Dudley, Mass., assignor to Imo Industries, Inc., Princeton, N.J.

Filed Jun. 13, 1988, Ser. No. 205,932

Int. Cl.[4] G01N *21/41*

U.S. Cl. 250—577 **24 Claims**



1. As an article of manufacture, a sensor element for mounting to a container to make an optical measurement of a particular level of liquid in the container, said sensor element comprising a tubular base housing having external means of fixed mounting to the container, said housing having an inner end for liquid exposure and an outer end for external communication of liquid-level intelligence, an elongate length of glass core of first refractive index with a cladding of second refractive index that is less than said first refractive index, said length having at least one bend exposed for liquid contact at the inner end of said housing, there being at least some straight extent of the cladded core with tangential continuity to the respective limits of said at least one bend, said straight extent attracting droplet formation away from said bend, said length otherwise extending in sealed relation within said housing, the outer radius of curvature of said bend being at least the diameter of the cladded core, and means at the respective ends of said length for completing a light circuit through said length.

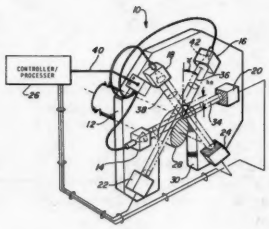
4,880,991
NON-CONTACT DIMENSIONAL GAGE FOR TURNED PARTS

Albert J. Boehnlein, Ypsilanti, and Kevin G. Harding, Ann Arbor, both of Mich., assignors to Industrial Technology Institute, Ann Arbor, Mich.

Continuation of Ser. No. 118,456, Nov. 9, 1987, abandoned. This application May 5, 1989, Ser. No. 349,957

Int. Cl.[4] G01J *3/45*

U.S. Cl. 250—560 **27 Claims**



1. An optical gage for evaluating the diameter of a workpiece comprising:

light source means for presenting first, second, and third light beams oriented along mutually nonparallel optical axes which are generally tangent to said workpiece, said light beams having a width less than the diameter of said workpiece and are positioned to be partially interrupted by the outside surface of said workpiece wherein the included angle formed by the tangent points between said light beams and said workpiece is less than 180°,

detector means for receiving said partially interrupted light beams and outputting a signal proportional to the extent of said interruption of each of said light beams, and

processing means coupled to said detector means for receiving said detector means signals and outputting data representative of said interruption thereby evaluating the curvature of said workpiece.

4,880,992
NON-CONTACTING MEASURING SYSTEM FOR PRECISION CHARACTERISTICS, PARTICULARLY OF INDUSTRIAL ROBOTS

Erich Niedermayr, Haar, and Robert Griessbach, Siegertsbrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,305

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734086

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—561 **11 Claims**

1. A non-contacting measuring system for acquiring the position of two coordinate systems with respect to one another, comprising:

a stationary coordinate system lying in a measuring plane, said stationary coordinate system having x, y and z axes;

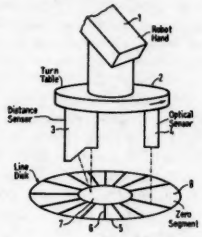
a moving coordinate system;

said measuring system having a turn table with a position

sensor, a distance sensor and an optical sensor, said measuring system located in said moving coordinate system;

a planar measuring subject lying in said measuring plane; and

a data processing system connected to said distance and optical sensors for acquiring output signals therefrom and



calculating the distance of the turn table from the measuring plane and of the tilt about the x axis and the y axis and the rotation about the z axis and the displacement in the x direction and in the y direction in response to output signals received from said measuring subject.

4,880,993

BUILDING HEAT AND POWER SYSTEM

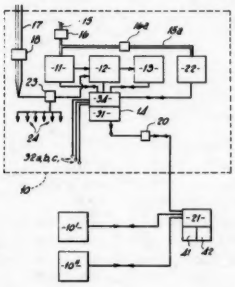
Julian P. Packer, Cheadle Hulme, and Sam Almozaffar, Near Northwich, both of England, assignors to Combined Power Systems Limited, Manchester, England

Filed Jun. 14, 1988, Ser. No. 206,503

Claims priority, application United Kingdom, Jun. 27, 1987, 8715131

Int. Cl.[4] F02D *29/06*

U.S. Cl. 290—2 **27 Claims**



1. A combined space heat and electrical power producing system for a building and comprising in combination:

a prime mover,

an electrical generator connected to be driven by the prime mover and adapted to provide the electrical power to the building,

heat recovery means in heat exchange relationship with the prime mover to recover waste heat therefrom and adapted to provide the space heat to the building,

a control arrangement adapted automatically to control the prime mover,

the control arrangement including an intelligent knowledge-based system scheduling maintenance operations and predicting failures of components and of the system.

4,880,994

METHOD AND DEVICE FOR THE REDUNDANT CONTROL OF A POWER CONTROLLED UNIT

Frecon Richard, Chavanay, France, assignor to La Telemecanique Electrique, France

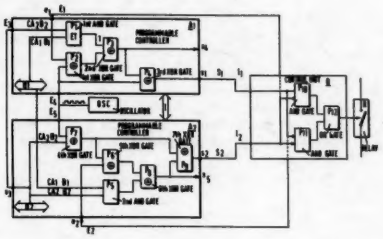
PCT No. PCT/FR87/00223, § 371 Date Feb. 17, 1988, § 102(e) Date Feb. 17, 1988

PCT Filed Jun. 17, 1987, Ser. No. 166,121

Claims priority, application France, Jun. 18, 1986, 86 09148

Int. Cl.[4] H01J *19/82;* H03K *17/56, 9/06, 5/22*

U.S. Cl. 307—219 **5 Claims**



1. A redundant logic circuit comprising first and second logic circuits each having a first input to which a binary logic signal is applied and an output, and a third logic circuit having inputs connected to the respective outputs of the first and second logic circuits, said first and second logic circuits respectively providing first and second output binary logic signals which are first and second respective functions of said binary logic signal and said third logic circuit providing a third output binary logic signal which is a third logic function of both said first and second output signals, the output signal of said third logic circuit being, in a normal mode of operation in which no failure is present in the redundant logic circuit, identical to said binary logic signal, whereas, when a failure is present in the redundant logic circuit, said failure having the effect of forcing to a predetermined logic level the output of either one of said first and second logic circuits, the other one of said first and second logic circuits will provide an output signal which is either identical to said binary logic signal, or the logic complement of said binary logic signal, said first logic circuit having a second input which is connected to the output of said second logic circuit and said second logic circuit having a second input which is connected to the output of said first logic circuit and said first and second logic functions together forming the inverse function of said third function.

4,880,995

ELECTRICALLY ISOLATED MOSFET DRIVE CIRCUIT

Satoshi Mori, Takarazuka, and Gourab Majumdar, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 802,367, Nov. 27, 1985, abandoned. This application Aug. 18, 1988, Ser. No. 233,855

Claims priority, application Japan, Nov. 29, 1984, 59-253286

Int. Cl.[4] A03K *3/01, 3/26*

U.S. Cl. 307—270 **5 Claims**

1. A circuit for driving a switching element in response to an input signal pulse from a driving signal generator, comprising:

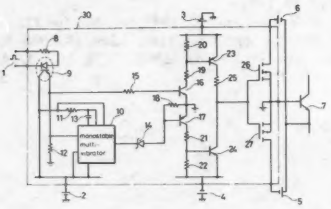
isolation means, responsive to said input signal pulse, for producing a pulse signal electrically isolated from said input signal pulse;

first signal generator means, responsive to said electrically isolated pulse signal, for generating a first signal synchronous with said electrically isolated pulse signal;

second signal generator means comprising a monostable multivibrator, responsive to a falling edge of said electrically isolated pulse signal, for generating a second signal

synchronous with the falling edge of said electrically isolated pulse signal;

third signal generator means, responsive to said second signal, for generating a third signal synchronous with said second signal; and



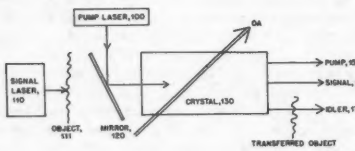
fourth signal generator means, responsive to said first and third signals, for generating an ON signal and an OFF signal, respectively, said ON signal activating said switching element and said OFF signal disabling said switching element.

4,880,996

OPTICAL PARAMETRIC AMPLIFYING VARIABLE SPATIAL FILTER

Phillip R. Peterson; Athanasios Gavrielides, and David A. Cardimona, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1988, Ser. No. 234,451
Int. Cl.[4] H03F 7/00
U.S. Cl. 307—425 **1 Claim**



1. An optical parametric amplifier system which illuminates an object of interest using a signal beam and parametrically mixes the signal beam from the object with a pump beam to produce an idler beam which maintains an image of the object of interest, said optical parametric amplifier system comprising:

a signal laser which illuminates said object of interest with said signal beam, said signal beam having a first frequency of value ω_s wherein said first frequency of said signal laser has a wavelength of about 1.0×10^{-4} cm;

a pump laser which produces said pump beam with a second frequency of value ω_p such that said second frequency of said pump laser has a wavelength of about 353×10^{-7} cm and wherein said pump laser produces said pump beam with an adjustable amplitude;

a beam combiner which produces a combined output signal which contains said pump beam and said signal beam by receiving and combining said pump beam from said pump laser with said signal beam reflected from said object of interest; and

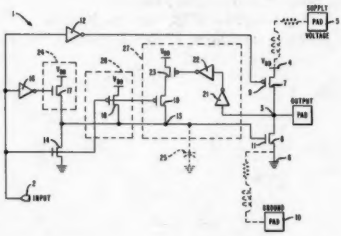
a nonlinear crystal which receives said combined output signal of said beam combiner, and which produces said idler beam by parametrically mixing the signal beam from said beam combiner which is contained in the combined output signal produced by the beam combiner with the pump beam such that said idler beam has a down conversion frequency ω_i which has a value which equals the value of the second frequency of said pump beam minus the first frequency of said signal abeam, said idler beam maintaining the image of the object of the object of interest in a transferred scene represented in a down converted frequency, and wherein said nonlinear crystal is a potassium dihydrogen phosphate crystal with a crystal length of about 5 cm and an optical gain of about 1.0/cm, and wherein said idler beam has an idler amplitude that is proportional to said adjustable amplitude of said pump beam so that said idler amplitude may be adjusted by variations in said adjustable amplitude in said pump beam, and wherein said potassium dihydrogen phosphate crystal has a cutoff frequency of about 500 radians/cm which enables said potassium dihydrogen phosphate crystal to act as an amplifying variable spatial bandpass filter as it produces said idler beam which has a tuneable amplitude which is adjusted with a direction of propagation determined by a paraxial phase match which is adjusted by varying an optical axis of the potassium dihydrogen phosphate crystal with the direction of propagation, and said idler beam produced by said potassium dihydrogen phosphate crystal during down conversion has a wavelength of about 545.0×10^{-7} cm, said potassium dihydrogen phosphate crystal thereby performing as a parametric down-converter.

4,880,997

LOW NOISE OUTPUT BUFFER CIRCUIT

David P. Steele, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 18, 1988, Ser. No. 233,506
Int. Cl.[4] H03K 17/16, 19/094, 5/13
U.S. Cl. 307—443 **10 Claims**



1. A CMOS circuit for providing a controlled transition rate output voltage at as output node in response to an input voltage on an input node and operable from common power supply and ground nodes, comprising:

first and second field effect transistors of respective first and second impurity type connected in electrical series to have the first transistor connected at one source/drain to the power supply node, the second transistor connected as one source/drain to the ground node, and the common connection of the remaining source/drains defining the output node;

a third field effect transistor of the second impurity type having a first source/drain connected to the power supply node and the second source/drain connected to the gate electrode of the second transistor and having its gate electrode connected to receive input node voltage based signals, the third transistor characterized in that the current conducted through the third transistor cuts off when its second source/drain voltage reaches a material fraction of the power supply node voltage;

a fourth field effect transistor of first impurity type connected between the power supply node and gate electrode of the second transistor and having its gate electrode connected to receive input node voltage based signals, the

fourth field effect transistor characterized by materially lower current conduction capability than the third transistor;

means for pulling the gate electrode of the second transistor to the voltage of the power supply node responsive to the output node voltage approaching the ground node voltage; and

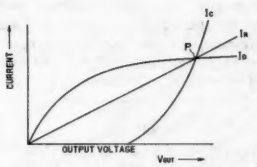
means for enabling the first field effect transistor to a conductive state complementary to that of the second field effect transistor in response to input node voltage based signals.

4,880,998

BIPOLAR TRANSISTOR AND CMOS TRANSISTOR LOGIC CIRCUIT HAVING IMPROVED DISCHARGE CAPABILITIES

Masahiro Ueda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,299
Claims priority, application Japan, Sep. 8, 1987, 62-225003
Int. Cl.[4] H03K *17/04*
U.S. Cl. 307—446 **6 Claims**



1. A logic circuit formed by combination of a bipolar transistor and a CMOS transistor, said logic circuit comprising:

an input terminal;

an output terminal;

a high-potential power source;

a low-potential power source;

a PMOS transistor having a gate connected to said input terminal and a source connected to said high-potential power source;

a first resistor having an end connected to the drain of said PMOS transistor and another end connected to said output terminal:

a first NPN transistor having a base connected to a node between said first resistor and said PMOS transistor, a collector connected to said high-potential power source and an emitter connected to said output terminal;

a first NMOS transistor having a gate connected to said input terminal and a drain connected to said output terminal;

a second resistor having an end connected to the source of said NMOS transistor and another end connected to said low-potential power source;

a second NPN transistor having a base connected to a node between said second resistor and said first NMOS transistor, a collector connected to said output terminal and an emitter connected to said low-potential power source; and

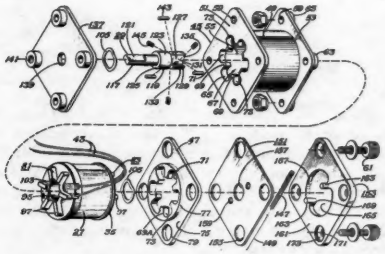
a second NMOS transistor having a gate directly connected to said input terminal, a drain connected to said output terminal and a source connected to said low-potential power source respectively.

4,880,999

SOLENOID

Robert A. Williams, Fort Worth, and Jeffrey W. Herron, Arlington, both of Tex., assignors to Williams Instruments, Inc., Fort Worth, Tex.

Filed Mar. 7, 1989, Ser. No. 319,665
Int. Cl.[4] H02K *33/00*
U.S. Cl. 310—37 **15 Claims**



1. A solenoid, comprising:

(a) a coil having conductive windings wrapped around a central opening, said central opening extending between first and second ends, said coil having inner and outer portions with said central opening extending through said inner portion;

(b) outer core means for providing an outer magnetic circuit portion on the outer portion of said coil, said outer core means having plural poles, each of said poles being separated from the adjacent poles by gaps;

(c) inner core means for providing an inner magnetic circuit portion in the inner portion of said coil, said inner core means being located within said coil central opening, said inner core means comprising rotor means;

(d) said rotor means being capable of turning relative to said coil, said rotor means having plural armatures located in said gaps between said poles such that each armature is between two of said poles, said rotor means being movable between a first position where there is an air gap between each of said armatures and said adjacent poles, and a second position where said armatures contact one of said respective adjacent poles, said rotor means moving from the first position to the second position when said coil is electrically energized;

(e) spring return means for returning said rotor means to the first position from the second position when said coil is deenergized;

(f) a shaft having an inner end and an outer end, said shaft inner end being located within said coil central opening such that said shaft outer end protrudes out of said coil, said shaft outer end being adapted to be coupled to a load;

(g) said shaft being made of a material with a relatively high magnetic permeability;

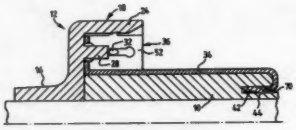
(h) drive means for driving said shaft when said rotor means moves from the first position to the second position, said drive means coupling said shaft to said rotor means when said rotor means moves from the first position to the second position, said drive means disengaging and allowing said shaft to remain stationary when said rotor means moves from the second position to the first position.

4,881,000

ARMATURE FOR AN ELECTRIC MOTOR

Patrick S. Wang, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory, Ltd., Chaiwan, Hong Kong

Filed Jul. 29, 1987, Ser. No. 78,994
Claims priority, application United Kingdom, Mar. 16, 1987, 8706167; Apr. 13, 1987, 8708781
Int. Cl.[4] H02K *13/04*
U.S. Cl. 310—234 10 Claims



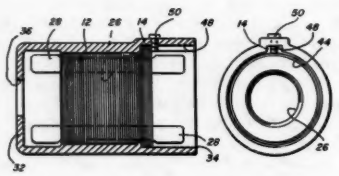
1. An armature for an electric motor, comprising a winding having connector portions, a plurality of commutator segments, each commutator segment having an integral terminal provided with a slot which straddles and grips a respective connector portion, a commutator base for supporting said commutator segments, and a terminal support separate from the base, aid support having a plurality of housings in which the terminals are located.

4,881,001

STATOR LAMINATE RETAINER ASSEMBLY

Navinchandra R. Patel, and Robert A. Schwarz, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 161,226, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 46,843, May 5, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 251,966
Int. Cl.[4] H02K *1/18, 5/00, 5/04*
U.S. Cl. 310—258 3 Claims



1. In a dynamoelectric machine, the combination comprising:

a stator assembly including a plurality of generally circular laminations bonded together in a generally cylindrical stacked array, a given number of laminations being enlarged in diameter substantially 360° thereabout, and at least some of said given number of laminations being further enlarged in diameter over less than 360° in circumference to define a radially outwardly projecting tab-like flange;

housing means having a generally cylindrical bore for receiving the stator assembly, shoulder means extending substantially 360° about the bore for axially abutting one side of said given number of laminations of the stator assembly to prevent axial movement of the stator assembly in at least one direction relative to the housing means, and an axially extending slot in the bore for receiving the flange of the stator assembly and preventing the stator assembly from rotating relative to the housing means; and

readily positionable axial retaining means movably mounted on the housing for radial movement into engagement with the opposite side of the given number of laminations to prevent movement of the stator assembly opposite said one direction.

4,881,002

MINIATURE MOTOR

Hitoshi Yamaguchi, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Chiba, Japan

Filed Jun. 10, 1988, Ser. No. 205,196
Claims priority, application Japan, Jun. 19, 1987, 62-94445[U]
Int. Cl.[4] H02K *1/22*
U.S. Cl. 310—261 6 Claims

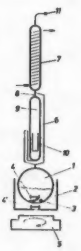
1. A miniature motor comprising a stator having permanent magnets constituting a two-pole field, and a rotor having rotor windings wound on a rotor core of a three-pole construction, each rotor core pole of said rotor core is formed in such a manner that the cross-sectional shape of said rotor core pole viewed in a direction normal to a motor shaft is symmetrical with respect to a radial center line of each pole of said rotor core and that at each rotor core pole a gap is formed between said permanent magnet and a predetermined range from said center line of an arc-shaped outer periphery of said rotor core facing said permanent magnet which is larger than a gap formed between said permanent magnet and other ranges of the outer periphery of said rotor core.

4,881,003

METHOD AND DEVICE FOR REDUCING THE WATER CONTENT IN PIEZOELECTRIC $GaPO_4$ CRYSTAL ELEMENTS AND SO PRODUCED CRYSTAL ELEMENTS

Günter Engel, Leitring; Peter W. Krempl, Graz/Ragnitz; Helmut List, Graz; Uwe Posch, Graz, and Alfred Nitsch, Graz, all of Austria, assignors to Avl Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Nov. 10, 1988, Ser. No. 269,794
Claims priority, application Austria, Nov. 11, 1987, 2983/87; Dec. 23, 1987, 3424/87
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—311 15 Claims



1. A method of reducing the water content in piezoelectric $GaPO_4$ crystal elements, wherein each of said piezoelectric $GaPO_4$ crystal elements is cut entirely from one uniform growth zone of a $GaPO_4$ raw crystal bar, and is free of any zone boundaries.

4,881,004

COLOR CATHODE RAY TUBE

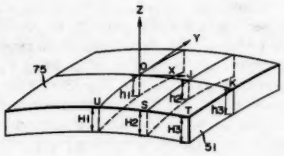
Masatsugu Inoue; Kiyoshi Tokita, both of Fukaya; Toshinao Sone; Takeshi Fujiwara, both of Kumagaya, and Kazunori Nakane, Fukiage, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 24, 1988, Ser. No. 236,184

Claims priority, application Japan, Aug. 26, 1987, 62-210287; Dec. 11, 1987, 62-311867

Int. Cl.[4] H01J *29/81, 29/86*

U.S. Cl. 313—408 **13 Claims**



1. A color cathode ray tube comprising:

a vacuum chamber including a panel, a funnel, a neck, and a tube axis, said panel having a face plate having a substantially rectangular front surface and an inner surface, said funnel having a funnel shape and being contiguous with a skirt of said panel, aid neck being a substantially cylindrical shape and being contiguous with said funnel;

a phosphor screen formed on said inner surface of said face plate;

an electron gun assembly, arranged in said neck, for emitting three electron beams which impinge on said phosphor screen;

deflection means for deflecting the three electron beams;

a shadow mask arranged in said panel to oppose said phosphor screen, said shadow mask including a substantially rectangular effective curved surface and apertures for allowing the three electron beams from said electron gun assembly to pass therethrough, and on which said tube axis is defined as a Z axis, and major and minor-axis directions are respectively defined as X and Y axes having a center through which the Z axis passes as an origin, a radius of curvature at the center of said effective curved surface of said shadow mask in a section taken along on X-Z parallel plane being larger than a radius of curvature at an effective diameter edge portion on the Y axis, and a radius of curvature at an effective diameter edge portion on the X axis being smaller than a radius of curvature at a diagonal effective diameter edge portion; and

supporting means for supporting said shadow mask.

4,881,005

FLAT TYPE DISPLAY DEVICE

Kiyoshi Morimoto; Hiroshi Watanabe; Shigeo Itoh; Yukio Ogawa, and Satoshi Uzawa, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Jul. 8, 1988, Ser. No. 216,350

Claims priority, application Japan, Jul. 14, 1987, 62-176764

Int. Cl.[4] H01J *29/70*

U.S. Cl. 313—422 **11 Claims**

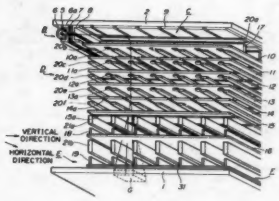
1. A flat type display device comprising:

a box-like airtight casing in which electrodes are arranged and of which an interior is evacuated to high vacuum;

a phosphor screen section having phosphor layers deposited thereon to form a display plane; said phosphor layers each emitting light due to impingement of an electron beam thereon;

an electron supply section arranged in said airtight casing so as to be positioned at an end of said airtight casing opposite to said display plane and including an electron source for discharging electron streams in a direction parallel to said display plane and an electron flow guide for guiding said discharged electron streams and turning them toward said display plane at a predetermined position;

an address electrode section for selecting and controlling a plurality of said electron streams drawn out from said electron supply section by means of at least horizontal and



vertical selecting electrodes to form an electron beam and addressing a desired position on said display plane; and

an accelerating electrode section for accelerating said electron beam formed at said address electrode section to impinge it on said phosphor screen section.

4,881,006

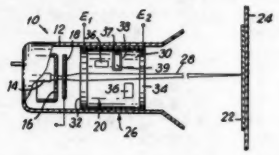
METHODS AND APPARATUS FOR POST-ASSEMBLY CUSTOM FINE-TUNING OF AN ELECTRON BEAM CHARACTERISTIC IN A CATHODE RAY IMAGING TUBE

Geoffrey S. M. Hedrick, Malverne, Pa., assignor to Innovative Solutions & Support, Inc., Malverne, Pa.

Filed Nov. 10, 1988, Ser. No. 269,587

Int. Cl.[4] H01J *9/236, 9/44*

U.S. Cl. 313—450 **41 Claims**



16. An electrostatic lens operable for focusing an electron beam on a focusing screen in a sealed envelope cathode ray tube, comprising:

a lens element having an axially-defined substantially central opening through which the electron beam passes and to which an electrical potential is operatively applied;

a substantially continuous region on said lens element formed of an electrically resistive material and providing a voltage gradient across said region to generate a substantially uniformly positionally-varying electrostatic field which operates on the electron beam as the beam passes through said lens element opening;

said region having at least a discontinuity lacking said resistive material so as to create a nonuniformity in said substantially uniformly positionally-varying electrostatic field;

said discontinuity being defined with a configuration and at a location of said region predeterminately selected in accordance with the operating characteristics of the particular tube by operating the tube to produce an image on the screen, examining the image, and defining in accordance with said examination of the image a suitable configuration and location for said discontinuity by which the cross-sectional shape of the electron beam is adjusted by the electrostatic field as the beam passes through said lens

opening to attain a predetermined cross-sectional shape of the beam, whereby said discontinuity provides compensation for tube-to-tube beam focus-affecting variations in the operating characteristics of the tube so as to assure attainment of the predetermined cross-sectional shape to the beam in each particular tube.

4,881,007

COMPACT GAS DISCHARGE TUBE AND A METHOD FOR ITS MANUFACTURE

Hans Egelstam, Karlskrona, Sweden, assignor to Lumalampan Aktiebolag, Sweden

Filed Mar. 8, 1988, Ser. No. 165,503
Claims priority, application Sweden, Mar. 23, 1987, 8701184
Int. Cl.[4] H01J *9/24, 61/32*
U.S. Cl. 313—493 **22 Claims**

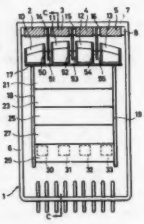
10. A compact gas-discharge lamp tube defining a closed discharge chamber comprising at least two U-shaped main tube components, each of said main tube components being made of glass and each having at least two limbs, a fluorescent layer coated on the inside surface of said lamp tube, a U-shaped connection portion joining said at least two main tube components together at two free limb ends thereof, electrode means provided one at each of the two outer free ends and said lamp tube closed discharge chamber, and the glass thickness of the internal cross-sectional area in said U-shaped connection portion being in the range of about 50% to about 100% of the glass thickness and the cross-sectional area, respectively, of the limbs of said main tube components.

4,881,008

PHOTOMULTIPLIER WITH PLURAL PHOTOCATHODES

Hiroyuki Kyushima; Kimitsugu Nakamura, and Takahito Kato, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka and Research Development Corporation of Japan, Tokyo, both of, Japan

Filed Apr. 18, 1988, Ser. No. 182,517
Claims priority, application Japan, Apr. 18, 1987, 62-95874
Int. Cl.[4] H01J *43/10*
U.S. Cl. 313—532 **8 Claims**



1. A photomultiplier for converting an incident light in to an amplified electrical signal, said photomultiplier comprising:

an air-tight enclosure having at the bottom thereof an end face plate for receiving the incident light, said end face plate being uniform in thickness in the longitudinal direction thereof;

a plurality of photocathodes provided on an inner surface of said end face plate, for converting the incident light into photoelectrons;

a plurality of dynodes of multiplying said photoelectrons, provided in common for all of said photocathodes;

a plurality of focusing electrodes provided between said photocathodes and said dynodes, for converging said photoelectrons into said dynodes; and

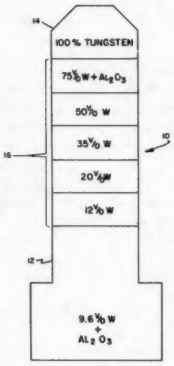
a plurality of anode electrodes assigned to said photocathodes respectively, for converting multiplied photoelectrons into electrical signals, each of said dynodes having on an inner wall thereof a plurality of electron emitting parts for emitting secondary electrons in response to said photoelectrons and a plurality of isolating parts for preventing said secondary electrons emitted from one of said electron emitting parts from straying into the other electron emitting parts, each of said isolating parts provided between adjacent electron emitting parts.

4,881,009

ELECTRODE FOR HIGH INTENSITY DISCHARGE LAMPS

Edmund M. Passmore, Gloucester, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 5, 1983, Ser. No. 557,812
Int. Cl.[4] H01J *61/06*
U.S. Cl. 313—631 **6 Claims**



1. A high intensity discharge lamp electrode comprised of a mixture of a refractory oxide and a metal, said electrode having first and second ends separated by an intermediate body; said first end comprising a low volume percent of said metal and said second end comprising a high volume percent of said metal; said intermediate body comprising gradually increasing amounts of said metal in progression from said first end to said second end.

4,881,010

ION IMPLANTATION METHOD AND APPARATUS

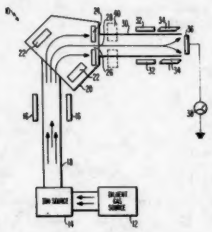
Neil R. Jetter, Palm Beach, Fla., assignor to Harris Semiconductor Patents, Inc., Melbourne, Fla.

Continuation of Ser. No. 793,233, Oct. 31, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 148,209
Int. Cl.[4] H01J *7/24*
U.S. Cl. 315—111.81 **6 Claims**

1. In an ion implantation apparatus including an ion source, ion analyzer, ion acceleration means and deflection means

interconnected in a sequential manner, the improvement comprising:

a controllable source of inactive diluent gas interconnected to the ion source so as to provide a means for selecting a concentration of dopant ions and diluent ions provided by



the ion source to the ion analyzer, the diluent ions being of different mass than the dopant ions, the ion analyzer including an apertured plate that can be selectively moved so as to permit passage therethrough, based on the difference in mass thereof, of said copant ions while blocking passage of said diluent ions.

4,881,011

CONTROL GEAR FOR HIGH INTENSITY GAS DISCHARGE LIGHTING

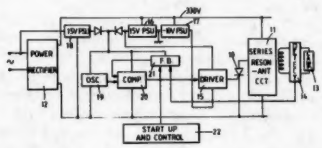
John Britton, Gnosall, Great Britain, assignor to Valor International Ltd. and HBH Equipment Ltd., both of London, England

Filed Oct. 21, 1987, Ser. No. 110,910

Claims priority, application United Kingdom, Oct. 22, 1986, 8625329

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—209 SC **20 Claims**



17. A control gear for a high intensity gas discharge lighting tube, comprising:

a control circuit having a switched side and a lamp side, and said switched side including:

an oscillator running at a fixed oscillator frequency,

drive means providing a drive signal exhibiting said oscillator frequency and a variable duty cycle ratio,

a switching element discrete from, and driven by said drive signal at said oscillator frequency,

a series resonant circuit tuned to said oscillator frequency,

transformer means having a primary winding connected in said series resonant circuit, and a secondary winding, for transferring power from said switched side to said lamp side of said circuit, and

said lamp side including means for connecting said secondary winding of the transformer to a lighting tube.

4,881,012

SWITCHING ARRANGEMENT

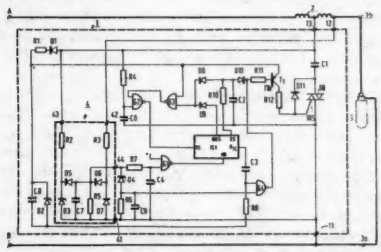
Antonius F. J. Almering, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,667

Claims priority, application Netherlands, Dec. 15, 1986, 8603179

Int. Cl.[4] H05B *41/04*

U.S. Cl. 315—209 R **17 Claims**



1. A switching arrangement for ignition of at least one high-pressure discharge lamp by the production of ignition pulses comprising, a first connection terminal intended to be connected to a first terminal of the lamp and a second and a third connection terminal for connection on either side of an impedance connected in series with a second terminal of the lamp, and means for suppressing the production of ignition pulses if the lamp fails, characterized in that a pushpull circuit is connected between the first, second and third connection terminals and is responsive to a voltage between said first and second terminals to produce at an output terminal thereof a control signal for said ignition pulse suppressing means, and means connecting the output terminal of the pushpull circuit to the means for suppressing the production of ignition pulses.

4,881,013

FLASH PHOTOGRAPHIC APPARATUS

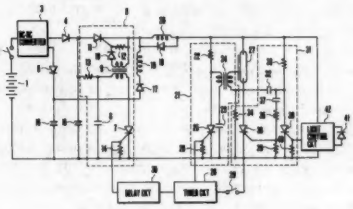
Hiroyuki Kataoka, Tokyo, and Tosiyuki Kumakura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 761,194, Jul. 31, 1985, abandoned. This application Aug. 21, 1987, Ser. No. 88,977

Claims priority, application Japan, Aug. 6, 1984, 59-163901; Aug. 6, 1984, 59-163899; Dec. 11, 1984, 59-261648; Apr. 2, 1985, 6069471

Int. Cl.[4] H05B *41/14*

U.S. Cl. 315—241 P **10 Claims**



1. A flash photographing apparatus comprising:

(a) flash means;

(b) a power source circuit;

(c) a triggering circuit for triggering said flash means;

(d) a first capacitor which is connected to said power source

circuit and is charged with an electric charge by an output of said power source circuit, said first capacitor being connected in parallel with said flash means;

(e) a first discharge path for discharging the electric charge accumulated at said first capacitor to said flash means, the discharging operating by said first discharge path being performed when the triggering operation of said triggering circuit is performed;

(f) a second capacitor which is connected to said power source circuit and is charged with an electric charge by an output of said power source circuit, said second capacitor being connected in parallel with said flash means;

(g) a second discharge path for discharging the electric charge accumulated at said second capacitor to said flash means; and

(h) discharge initiating means for discharging the electric charge accumulated at said second capacitor through said second discharge path after discharge of said first capacitor through said first discharge path is started by triggering said flash means by said triggering circuit, and during this discharging of the first capacitor, wherein an inductance value in said first discharge path to said flash means of the electric charge accumulated at said first capacitor is set larger than an inductance value in said second discharge path to said flash means of the electric charge accumulated at said second capacitor.

4,881,014

STABILIZED ELECTRIC POWER APPARATUS FOR GENERATING DIRECT AND ALTERNATING CURRENT SIMULTANEOUSLY IN ONE TRANSFORMER

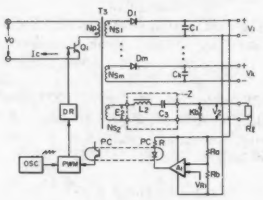
Sadao Okochi, Fussa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 32,017, Mar. 30, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,632

Claims priority, application Japan, Mar. 31, 1986, 61-73423

Int. Cl.[4] H05B *41/16*

U.S. Cl. 315—246 **4 Claims**



1. A stabilized electric power apparatus, comprising:

switching means for converting direct current into an alternating current pulse by switching;

a primary coil for inputting the generated pulse;

a plurality of secondary coils, being connected electrically to said primary coil and corresponding to both direct and alternating current outputs;

impedance means including choke coil means connected in series with one of said plurality of secondary coils corresponding to the alternating current output for stabilizing the current output thereof and for operating as ballast;

control means responsive to the output voltage of one of said plurality of said secondary coils corresponding to the direct current output and for controlling said switching means so that the output of said direct current output and said alternating current output are constant; and

negative resistance means connected with said secondary coil for alternating current output.

4,881,015

COLOR CATHODE-RAY APPARATUS HAVING AN IMPROVED DEFLECTION UNIT

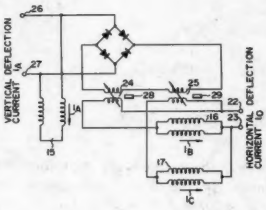
Taketoshi Shimoma, Isesaki; Katsuei Morohashi, Menuma, and Jiro Shimokobe, Fukaya, all of Japan, assignors to Kabushiki Kaishia Toshiba, Kawasaki, Japan

Filed Sep. 15, 1988, Ser. No. 244,824

Claims priority, application Japan, Sep. 16, 1987, 62-229453; Apr. 27, 1988, 63-102708

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **13 Claims**



1. A color cathode-ray apparatus comprising:

an evacuated envelope having a tube axis and horizontal and vertical axes intersecting the tube axis at right angles and intersecting each other at right angles;

a phosphor screen incorporated within said evacuated envelope;

an in-line electron gun assembly for emitting three electron beams toward said phosphor screen;

horizontal deflection means for generating a horizontal deflection magnetic field thereby deflecting the electron beams along said horizontal axis;

first and second vertical deflection means for generating a vertical deflection magnetic field thereby deflecting the electron beams along said vertical axis, said first vertical deflection means including a first pair of deflection coils having a first deflection center, for generating a first magnetic field, and said second vertical deflection means including a second pair of deflection coils having a second deflection center, for generating a second magnetic field, said first and second deflection centers being located at different points on the tube axis and said second deflection center being defined between said first deflection center and said electron gun assembly; and

current-supplying means for supplying a horizontal deflection current, a first vertical deflection current and a second vertical deflection current to said horizontal deflection means, said first pair of deflection coils and said second pair of deflection coils, respectively, thereby energizing said horizontal deflection means and said first and second pair of deflection coils, and first and second vertical deflection currents being changed in different manners, in accordance with a degree to which the electron beam are to be deflected vertically.

4,881,016

ACTIVE SHADOW MASK COLOR CRT

Arthur A. Margolis, 1201 S. Ocean Dr., Apt. 2307N, Hollywood Beach, Fla. 33019

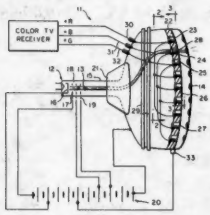
Filed Dec. 9, 1988, Ser. No. 282,322

Int. Cl.[4] H01J *29/80*

U.S. Cl. 315—376 **15 Claims**

1. In combination with a cathode ray display having an electron gun from which a single electron beam is emitted, a deflection yoke through which the electron beam passes, a phosphor display screen on which the electron beam impinges at locations under control of the deflection yoke and collimation lens means operatively positioned adjacent to the deflection yoke for maintaining travel of electrons in the electron

beam along parallel paths approaching the display screen, a system for displaying multi-color image information on the display screen, comprising shadow mask means operatively positioned between the collimation lens means and the display screen for dividing said single electron beam into a plurality of color beam segments, modulating means operatively connected to the shadow mask means for respectively varying the color beam segments in intensity in accordance with different corresponding input signals and means operatively mounted on the shadow mask means for restoring the travel of the electrons along said parallel paths following displacement therefrom by operation of said modulating means.

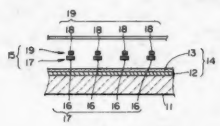


4,881,017

DISPLAY DEVICE WITH STRETCHED ELECTRODE ASSEMBLIES HAVING DIFFERENT RESONANT FREQUENCIES

Yoshihisa Tsuruoka, Mobara, Japan, assignor to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Mar. 7, 1988, Ser. No. 164,900
Claims priority, application Japan, Mar. 20, 1987, 62-64325
Int. Cl.[4] H01J *17/49, 63/02, 19/42*
U.S. Cl. 313—495 **8 Claims**



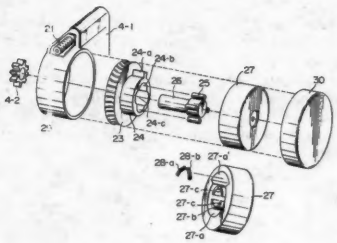
1. A display device comprising:
an envelope;
at least two sets of electrode groups arranged in directions intersecting each other within said envelope, one of said electrode groups being stretched in a space within said envelope;
said electrode group stretched in said space including a main electrode assembly wherein said main electrode is bifurcated and such that one of each of the auxiliary electrodes in the assembly is arranged so as to be in the gap of each of said main electrodes in the assembly; and
a plurality of display sections defined at intersections between said two sets of electrode groups, said display sections being selectively driven for luminous display by driving said two sets of electrode groups.

4,881,018

MANUALLY ASSISTABLE ELECTRIC DRIVING DEVICE

Yoji Kato, Konan; Osamu Minai, Kariya; Hirosi Tukamoto, Okazaki; Takashi Hagiwara, Chiryu, and Katsuji Kosaka, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 9, 1988, Ser. No. 282,050
Claims priority, application Japan, Dec. 18, 1987, 62-322065
Int. Cl.[4] F16D *23/00;* **H02K** *7/10*
U.S. Cl. 318—9 **6 Claims**



1. A manually assistable electric driving device of the type in which a driven member can be electrically driven in forward and backward directions and the movement of the driven member being driven electrically can be manually assisted to increase the speed of the movement, the device comprising:
a reversible electric motor;
a first rotor adapted to be driven by said electric motor and having an axial through-hole, said first rotor having at least one arcuate recess formed in the inner peripheral surface of said axial through-hole and having slopes at the opposite ends of said recess;
a second rotor having a cylindrical outer peripheral surface and rotatably disposed in said axial through-hole in said first rotor;
a bearing means disposed in said arcuate recess in said first rotor and adapted to be brought into engagement with said slopes of said arcuate recess and with said outer peripheral surface of said second rotor;
bearing retainer for supporting said bearing means such that said bearing means is movable radially and circumferentially of said first rotor;
resilient means operative to store an elastic energy when said first rotor is rotated by said electric motor relative to said second rotor so that one of said slopes of said first rotor is drivingly coupled by said bearing means to said outer peripheral surface of said second rotor, the thus stored elastic energy driving said bearing means to a substantially central portion of said arcuate recess when said electric motor is stopped whereby said second rotor is freely rotatable independently of said first rotor; and
said driven member being drivingly connected to said second rotor.

4,881,019

WIPER CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE FACILITATED FRONT AND REAR WIPERS

Yasuhiro Shiraishi, Sagamihara, and Yoshinori Nagamine, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Apr. 29, 1987, Ser. No. 44,053
Claims priority, application Japan, Apr. 30, 1986, 61-100570
Int. Cl.[4] B60S *1/08*
U.S. Cl. 318—68 **11 Claims**

1. A control system for an automotive wiper system including a front wiper and a rear wiper, comprising:
a front wiper motor for driving a front wiper blade;
a rear wiper motor for driving a rear wiper blade;

a front wiper control circuit connected to said front wiper motor for producing a front wiper drive signal having a given frequency for driving said front wiper motor at said given frequency;

a rear wiper control circuit connected to said rear wiper motor for receiving said front wiper drive signal, and for dividing the frequency of said front wiper drive signal by a given value and generating a rear wiper drive signal for driving said rear wiper motor;

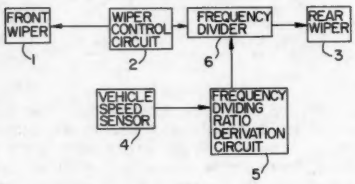
a vehicle speed sensor for producing a vehicle speed indicative signal having a value representative of the vehicle speed; and

means, responsive to said vehicle speed indicative signal, for deriving said given value based on the vehicle speed indicative signal value.

9. A control system for an automotive wiper system including a front wiper and a rear wiper, comprising:

a front wiper motor for driving a front wiper blade;

a rear window motor for driving a rear wiper blade;



a front wiper control circuit connected to said front wiper motor for producing a front wiper drive signal having a given frequency for driving said front wiper motor at said given frequency, said front wiper control circuit being operable in an intermittent mode for producing an intermittent signal for intermittently driving said front wiper motor with a predetermined interval;

a rear wiper control circuit connected to said rear wiper motor for receiving said front wiper drive signal, and for dividing the frequency of said front wiper drive signal by a given value and generating a rear wiper drive signal for driving said rear wiper motor;

a vehicle speed sensor for producing a vehicle speed indicative signal having a value representative of the vehicle speed; and

means, responsive to said vehicle speed indicative signal, for deriving said given value based on the vehicle speed indicative signal value.

4,881,020

APPARATUS FOR CONTROLLING ATTITUDE OF VEHICLE MOUNTED DEVICE

Tsuneo Hida, Toyokawa; Sumio Takizawa; Hakumi Ishii; Hideo Kegasa, and Minoru Izawa, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Aug. 12, 1986, Ser. No. 895,631

Claims priority, application Japan, Aug. 13, 1985, 60-178442; Aug. 13, 1985, 60-178443; Aug. 13, 1985, 60-178444; Aug. 13, 1985, 60-178445

Int. Cl.[4] G05G *5/00*

U.S. Cl. 318—626 **20 Claims**

1. Apparatus for controlling the attitude of vehicle mounted device comprising

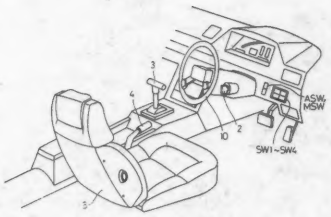
an onboard attitude controlling mechanism which controls the attitude of a vehicle mounted device such as a steering wheel, a seat or the like;

an electric drive unit for driving the onboard attitude controlling mechanism;

means for detecting the attitude of a vehicle mounted device;

at least one switch means commands a control over the attitude of a vehicle mounted device;

and electronic control means for energizing the electric drive unit to control the attitude of a vehicle mounted device in response to the on condition of the switch means which is construed as a command to control the attitude, and the control means including storage means for storing a limit position with said control means being responsive to the presence or absence of a stored limit position, the



control means having means for detecting an abnormality in the operation of said electric drive unit in the event of absence of a stored limit position to thereby determine and store as a limit position an attitude which is driven back through a given stroke as referenced to the prevailing attitude of the vehicle mounted device when the abnormality is detected, the control means deenergizing the electric drive unit automatically when the vehicle mounted device reaches a stored limit position in the event of the presence of the storage.

4,881,021

NUMERICAL CONTROL EQUIPMENT

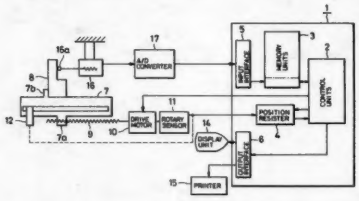
Hayao Hirai, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 41,375, Apr. 22, 1987, abandoned. This application Oct. 23, 1987, Ser. No. 112,002

Claims priority, application Japan, Apr. 22, 1986, 61-91197

Int. Cl.[4] G05B *19/18*

U.S. Cl. 318—569 **14 Claims**



1. A numerical control apparatus, comprising:

a table for holding an object to be measured;

drive means for driving said table;

control means for providing movement instructions to said drive means in order to move said object on said table to a target position;

position sensor means for detecting the position of said table;

position register for receiving a detection signal from said position sensor means;

measuring means for measuring the difference between a stop position of said object on said table and a reference position on said table, as said object on said table is moved to said target position; and

memory means for storing the output of said measuring means as data;

wherein said control means receives said output of said measuring means and an output of said position register, and controls said memory means to rewrite said data in said memory means as a measurement result.

4,881,022

METHOD AND/OR APPARATUS FOR CONTROLLING THE MOTOR SPEED OF AN ELECTRIC AC MOTOR AND/OR A METHOD OF DETERMINING TORQUE

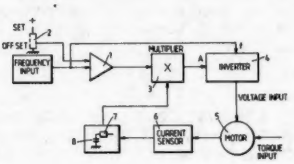
John T. Boys, Auckland, New Zealand, assignor to University of Auckland, Auckland, New Zealand

Continuation of Ser. No. 841,763, Mar. 20, 1986, abandoned. This application May 10, 1988, Ser. No. 191,711

Claims priority, application New Zealand, Mar. 21, 1985, 211523

Int. Cl.[4] H02P 5/40

U.S. Cl. 318—800 16 Claims



1. A method of controlling the motor speed of an electric AC motor comprising the steps of:

(a) generating a voltage having a frequency characteristic following substantially the relationship

$$|V_1| = k_1\sqrt{M_r}\left(\omega + \frac{R_1\omega s}{R_2}\right)$$

where

V_1=generated voltage,

M_r=rated Torque of the motor, and

ω=supply frequency,

ω_s=rated slip

(b) measuring the motor current in per unit terms,

(c) multiplying said measured motor current signal and the said generated voltage, and

(d) supplying the voltage so formed as the terminal voltage supplied to the motor.

4,881,023

HYBRID HIGH SPEED VOLTAGE REGULATOR WITH REDUCTION OF MILLER EFFECT

Eugene T. Perusse, San Diego, and Eugene L. Hammer, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

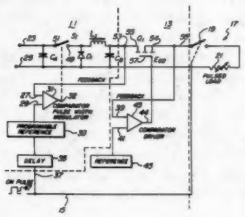
Continuation of Ser. No. 164,281, Mar. 4, 1988, abandoned. This application May 9, 1989, Ser. No. 349,876

Int. Cl.[4] G05F 1/563

U.S. Cl. 323—266 19 Claims

19. In a voltage regulator for regulating voltage supplied to a load which is activated during a load pulse and wherein said voltage regulator exhibits a response time which decreases with increase in input voltage to said regulator and power consumption which increases with increase in input voltage, the improvement comprising:

means for supplying an increased input voltage to said voltage regulator at the beginning of said load pulse to provide faster response and thereafter reducing said input voltage to reduce power consumption.



4,881,024

VOLTAGE SENSITIVE SWITCH

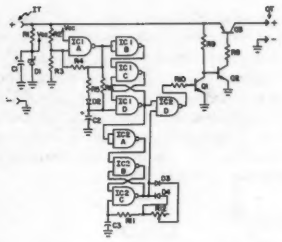
L. Paul Hartwick, London, Canada, assignor to Trek-Tron Coolers Inc., Brantford, Canada

Filed Dec. 9, 1988, Ser. No. 281,645

Claims priority, application Canada, Sep. 5, 1988, 566335

Int. Cl.[4] G05F 5/00

U.S. Cl. 323—299 6 Claims



1. A voltage comparison circuit for comparing an analogue voltage of a source, said circuit comprising:

(a) a first digital gate in series with a second digital gate acting as an inverter, and a pair of digital gates arranged as flip flops each digital gate with a pair of inputs;

(b) a feedback resistor interconnecting the output of said first digital gate to one of the inputs of said first digital gate;

(c) a voltage divider connected between the voltage source and said feedback resistor; and,

(d) means for providing a predetermined reference voltage to the other input of said digital gate.

4,881,025

FREQUENCY DEPENDENT IDENTIFICATION OF MATERIALS

William D. Gregory, Hannawa Falls, N.Y., assignor to Trustees of the Diotec Trust, Canton, N.Y.

Filed Sep. 26, 1988, Ser. No. 248,639

Int. Cl.[4] G01R 27/26

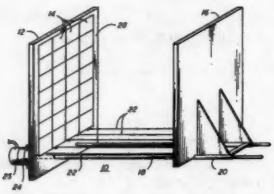
U.S. Cl. 324—61 R 18 Claims

1. A method of non-destructively identifying and assaying the make-up of a test object by comparison with a statistical record of a plurality of similar known objects by use of a capacitance sensor having a pair of parallel plates which have an adjustable spacing therebetween which can be established at

accurately known intervals, and at least a first of the plates being configured as an array of independent plate segments which can be selectively employed, each of the segments being coupled to respective means to sense a current thereat at an accurately measured phase and frequency, the method comprising the steps of

placing said test object between said parallel plates, accurately adjusting the spacing between said plates to correspond with a thickness dimension of the object, and selecting the appropriate ones of said segments to correspond with a cross section of the object;

applying a plurality of sinusoidal voltages each of an accurately known amplitude, frequency, and phase, to the other plate of said capacitive sensor;



accurately measuring magnitudes and phases of the electric currents in each of said selected segments of the first of the plates for the applied sinusoidal voltage of each said frequency;

from said measured electric current magnitudes and phases, calculating one or more parameters including at least one of the capacitance, conductance, frequency dependence of capacitance, and frequency dependence of conductance for said test object; and

comparing said calculated parameters for the test object with stored values that represent a statistically normal range of such parameters that characterize a plurality of known objects similar to said test object.

4,881,026

METHOD AND APPARATUS FOR DIAGNOSING ABNORMAL STATE OF SODIUM (NA)—SULFUR (S) CELL

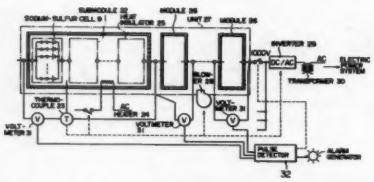
Yasumasa Ishida; Hiroyuki Kawamoto, both of Hitachi; Motoi Wada, Kyoto; Hisamitu Hatoh; Yoshiteru Miyatake, both of Hitachi; Sadao Mori, Chiba, and Eiji Takahashi, Tokyo, all of Japan, assignors to Hitachi, Ltd. and The Tokyo Electric Power Co., Ltd., both of Tokyo, Japan

Filed Jun. 25, 1987, Ser. No. 66,208

Claims priority, application Japan, Jun. 25, 1986, 61-147069

Int. Cl.[4] G01N *27/00*

U.S. Cl. 324—71.1 **7 Claims**



1. A method of operating a power storage plant including DC to AC inverter means connected to the output of unit banks of batteries that are connected to receive a DC charge and to discharge through said inverter wherein the method includes:

diagnosing the presence or absence of an abnormal state in advance or breakdown of a cell in a bank including at least three or more modules connected in series which are replaceable as a unit, each module including at least two or more sub-modules connected in series with each sub-module including at least four or more cells connected in parallel and with each cell being a sodium-sulfur (Na/S) cell containing at least one of a porous electrical conductive material impregnated with molten sulfur and a porous electrical conductive material impregnated with sodium polysulfide as its positive electrode reactant and containing sodium as its negative electrode reactant, said method comprising:

observing separately the operating voltage of each of said modules as a smallest component to be monitored during direct current charging and discharging so as to detect occurrence of a minute ripple in the operating voltage which exceeds a predetermined amplitude; and

when the amplitude of said ripple and the frequency of occurrence of said ripple increases as a result of repeated cycles of charging and discharging, deciding that degradation of said sodium-sulfur cell has progressed to an extent that final breakdown of said cell will occur in a very near future.

4,881,027

CIRCUIT ARRANGEMENT COMPRISING INPUT CIRCUITS TO FIND A POWER OUTPUT SUM FOR APPLICATION IN MULTI-PHASE ELECTRICITY METERS

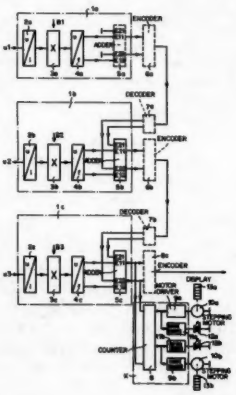
Andreas Joder, Unterägeri, and Franz Renggli, Buchrain, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Jul. 28, 1988, Ser. No. 225,526

Claims priority, application Switzerland, Aug. 6, 1987, 03030/87

Int. Cl.[4] G01R *11/16, 21/06*

U.S. Cl. 324—107 **3 Claims**



1. A circuit arrangement for summing power outputs for use in a multi-phase electricity meter, said circuit arrangement comprising:

a plurality of inputs circuits arranged in a sequence, each of said input circuits comprising an input converter, a multiplier connected to said input converter, and a voltage-to-frequency converter connected to said multiplier,

starting at least with the second input circuit in said sequence, each of said input circuits comprising an adder

having a first input means connected to the voltage-to-frequency converter of the corresponding input circuit, a second input means connected to an output of the preceding input circuit in said sequence, and an output which forms an output of the corresponding input circuit.

wherein

each voltage-to-frequency converter is provided with a first output for positive power and a second output for negative power,

the first input means of each adder comprises first and second inputs,

the second input means of each adder comprises first and second inputs,

each adder has first and second outputs, one for positive power and one for negative power, said first and second outputs of each adder forming first and second outputs of the corresponding input circuit,

said first and second outputs of each frequency converter being connected, starting at least with the second input circuit in said sequence, to the first and second inputs of the first input means of the corresponding adder, and

said first and second inputs of the second input means of each adder being connected to a position power output and a negative power output of the preceding input circuit in said sequence.

4,881,028

FAULT DETECTOR

James A. Bright, 5721 S. Hanover Way, Englewood, Colo. 80111

Filed Jun. 13, 1988, Ser. No. 205,952

Int. Cl.[4] G01R *1/20, 19/14*

U.S. Cl. 324—127 **3 Claims**

1. A fault detector and indicator for monitoring the current in a power line which may be immersed in water comprising, a detector mounted adjacent the power line, magnetic coupling means coupled to said power line and supplying an output to said detector, a light generator in said detector receiving the output of said magnetic coupling means and producing light emission in response thereto, a fiber optics cable with one end attached to said detector such that it receives light energy emitted by said light generator, and an indicator located remotely from said detector connected to a second end of said fiber optics cable and producing an indication from the received light energy indicative of the current in said power line, wherein said indicator includes a photo-voltic cell which is mounted so as to receive light energy from said second end of said fiber optic cable and indicating means connected to said photo-voltic cell, wherein said indicating means includes first and second display means for, respectively, displaying indications of "normal" or "alarm" conditions for the current monitored in said power line, including a threshold detector connected to the output of said photo-voltic cell, a two-way switch with a moveable switch contact connected to one output lead of said photo-voltic cell and with two fixed contacts, respectively, connected to said first and second display means, a second output lead of said photo-voltic cell connected to said first and second display means, and a relay connected to receive the output of said threshold detector and connected to the moveable contact of said two-way switch.

4,881,029

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES AND METHODS FOR TESTING SAME

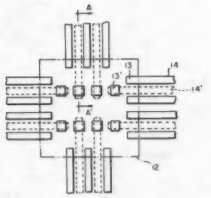
Masahiko Kawamura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1986, Ser. No. 911,739

Claims priority, application Japan, Sep. 30, 1985, 60-216513

Int. Cl.[4] G01R *31/00, 31/02*

U.S. Cl. 324—158 R **15 Claims**



1. A semiconductor integrated circuit device, comprising:

(i) a semiconductor integrated circuit chip having a plurality of signal wires;

(ii) a plurality of electron beam test terminals electrically connected to said signal wires, said electron beam test terminals being concentrated in at least one selected area of said semiconductor integrated circuit chip;

(iii) first connecting wires being connected to ones of said signal wires and extending into said selected area;

(vi) second connecting wires being connected to others of said signal wires, said second connecting wires having a level lower than that of said first connecting wires, extending into said selected area with a length longer than that of said first connecting wires, and being respectively positioned between said first connecting wires in said selected area;

(v) an insulating layer disposed between said first and second connecting wires, said insulating layer having apertures at which tip portions of said second connecting wires are exposed; and

(vi) conductive layers formed in the same plane and made from the same material as said first connecting wires, said conductive layers contacting said second connecting wires through said apertures and forming a first group of said electron beam test terminals, and portions of said first connecting wires in said selected area forming a second group of said electron beam test terminals.

4,881,030

METHOD AND APPARATUS FOR MEASURING AND PRECISELY LOCATING INTERNAL TENSILE STRESSES IN HARDENED REGIONS OF COMPONENTS BY MEASURING COERCIVE FIELD STRENGTH AND BARKHAUSEN NOISE AMPLITUDE

Erwin Stuecker, Essen-Frintrop; Gerhard Hofer, Roettenbach; Dietmar Koch, Muelheim an der Ruhr, and Uenal Guenes, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktinegesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 182,845

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3713062

Int. Cl.[4] G01B *7/24;* **G01N** *27/72;* **G01R** *33/00, 35/00*

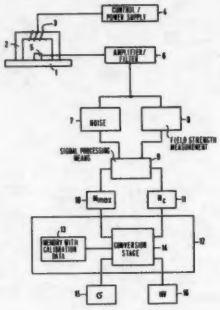
U.S. Cl. 324—209 **16 Claims**

10. Apparatus for ascertaining internal stresses in a hardened

region to be tested of a component made of a predetermined material, comprising:

(a) an exciter system and a measurement pickup system measuring at least one of amplitude of magnetic Barkhausen noise and coercive field strength and producing measured values;

(b) electronic evaluation means connected to said measurement pickup system for processing the measured values of the coercive field strength and the amplitude of the magnetic Barkhausen noise in parallel;



(c) said electronic evaluation means including at least one memory having calibration data or calibration functions for at least one material relating to dependencies between the Barkhausen noise amplitude, the coercive field strength, the hardness and the mechanical stress; and

(d) said electronic evaluation means including a conversion stage converting the measured values into material properties of hardness and stress using the calibration data stored said at least one memory.

4,881,031

EDDY CURRENT METHOD AND APPARATUS FOR DETERMINING STRUCTURAL DEFECTS IN A METAL OBJECT WITHOUT REMOVING SURFACE FILMS OR COATINGS

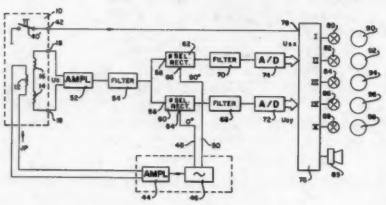
Helmut Pfisterer, Essen; Wolfgang Schütze, Oberhausen, and Heinz Wezel, Reutlingen, all of Fed. Rep. of Germany, assignors to Institut Dr. Friedrich Forster Pruferatebau GmbH, Reutlingen, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 207,664

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720686

Int. Cl.[4] G01N *27/90*; G01R *33/12*

U.S. Cl. 324—233 **5 Claims**



1. Apparatus for determining the presence of corrosion in a metal object coated with a generally electrically non-conductive material, comprising:

probe means having a face for being placed on the surface of the metal object, the probe means including an excitation coil, and a pair of receiver coils which are disposed symmetrically to the excitation coil and connected serially opposed to one another, the receiver coils located at different distances from the face;

an oscillator interconnected with the excitation coil to induce eddy currents in the metal object, said eddy currents inducing a reaction signal in the receiver coils;

a preamplifier connected across the series connected receiver coils;

first and second phase selective rectifiers each having an input connected to the preamplifier output;

said oscillator having two output terminals for providing two control signals of 90 degree phase difference, which terminals are individually connected, respectively, to control the first and second phase selective rectifiers;

the rectifiers being individually connected to first and second analog to digital convertors; and

means responsive to the digital output of the analog to digital converters for producing separate identification displays for each of a plurality of ranges of paired digital signals from the first and second converters, into which a complex plane of the digital signals has been divided, each of said paired digital signals defining a point in said complex plane, and one of which ranges represents a metal surface substantially free of corrosion.

4,881,032

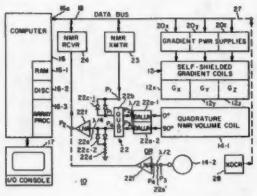
METHOD OF, AND APPARATUS FOR, NMR SPECTROSCOPIC METABOLITE IMAGING AND QUANTIFICATION

Paul A. Bottomley, Clifton Park; Peter B. Roemer; William A. Edelstein, both of Schenectady, and Otward M. Mueller, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 21, 1988, Ser. No. 260,633

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **30 Claims**



1. A method for nuclear magnetic resonance (NMR) cmspectroscopic imaging of metabolites in a sample, comprising the steps of:

(a) placing the sample in a static magnetic field B_0 directed in a first direction of a coordinate set;

(b) exciting NMR signals in at least a desired portion of the sample;

(c) applying to at least a desired portion of the sample a combination of d, where d=1, 2 or 3, phase-encoding magnetic field gradients, each in a different direction in the coordinate set, to define a d-dimensional set of voxels within the sample portion, in a manner to substantially eliminate from at least the desired sample portion eddy currents induced response to any phase-encoding gradient;

(d) then acquiring a free-induction-decay (FID) NMR response signal from each of the different voxels of the set within the sample portion; and

(e) processing the SNR-maximized FID response signals set to obtain a displayable image of the spectral information contained in at least one of the FID response signals.

4,881,033

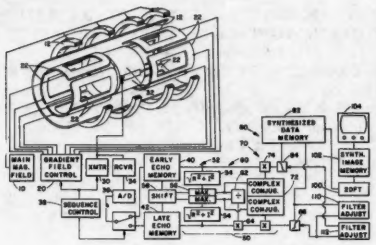
NOISE-REDUCED SYNTHETIC T2 WEIGHTED IMAGES

Kenneth S. Denison, Shaker Hts.; G. Neil Holland, Chagrin Falls, and Gordon D. DeMeester, Wickliffe, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation of Ser. No. 66,039, Jun. 24, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 331,750

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 22 Claims



1. A method of magnetic resonance imaging comprising:

after each excitation of magnetic resonance, causing a plurality of magnetic resonance echoes, early echoes close in time to the excitation having better resolution of details of structure in the image region and poorer T2 contrast and late echoes further in time from the excitation having poorer structural detail resolution and better T2 contrast;

collecting magnetic resonance signals during the early and late echoes to collect early echo data and late echo data;

combining a fractional portion of the early echo data with a fractional portion of the late echo data which is complementary to the early echo data portion to produce a synthesized data set; and,

Fourier transforming the synthesized data set to produce a synthetic image which has characteristics of an early echo image and characteristics of a late echo image.

4,881,034

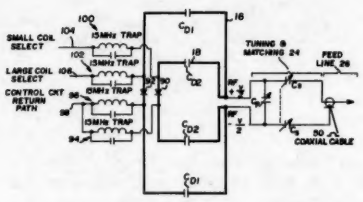
SWITCHABLE MRI RF COIL ARRAY WITH INDIVIDUAL COILS HAVING DIFFERENT AND OVERLAPPING FIELDS OF VIEW

Leon Kaufman, San Francisco; Mitsuaki Arakawa, Hillsborough; Barry M. McCarten, Los Altos; John H. Fehn, El Sobrante, and Stephen Krasnor, Oakland, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 19, 1988, Ser. No. 145,279

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 34 Claims



1. An RF MRI receiving coil array comprising:

a tuning and matching circuit for connection to an RF transmission line;

a first MRI RF receive coil adapted for receiving RF signals from a predetermined NMR species;

a second MRI RF receive coil also adapted for receiving RF signals from the same said predetermined species;

said first and second MRI RF receive coils having differently dimensioned and overlapping fields of view; and

controllable switch means connected with said tuning and matching circuit and with said first and second receive coils and capable of selectively conditioning either one of said coil assemblies for use in receiving RF signals and routing them through said tuning and matching circuit during an MRI procedure.

4,881,035

MAGNETIC STRUCTURAL ARRANGEMENT OF AN INSTALLATION FOR NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY WITH SUPERCONDUCTING BACKGROUND FIELD COILS AND NORMAL-CONDUCTING GRADIENT COILS

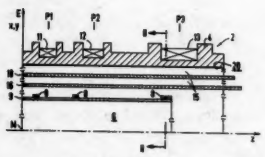
Horst Siebold, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,775

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739838

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—320 14 Claims



1. A magnetic structural arrangement of an installation for nuclear magnetic resonance tomography having superconducting background field coils cooled by a cryogenic medium for generating a homogeneous magnetic background field, normal-conducting coils within an inner space bounded by the background field coils for forming magnetic field gradients, and at least one cooled radiation shield of electrically and thermally conducting material which is disposed between the normal-conducting gradient coils and the superconducting background field coils, on the side of the background field coils facing the inner space a tubular shielding structure being disposed which at least contains superconducting material of the second kind and is thermally coupled to the cryogenic medium of the background field coils, the radiation shield being configured to suppress eddy currents induced in it at least by the gradient coils.

4,881,036

PHASE SHIFT COMPENSATION FOR METAL DETECTION APPARATUS

Klaus Ausländer, Reutlingen; Hans-Jürgen Fabris, Pfullingen; Wolfgang Patzwaldt, Reutlingen, and Helmut Seichter, Pfullingen, all of Fed. Rep. of Germany, assignors to Institut Dr. Friedrich Förster Prüfgerätebau GmbH, Reutlingen, Fed. Rep. of Germany

Filed Jul. 16, 1987, Ser. No. 74,232

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3707210

Int. Cl.[4] G01V *3/11, 3/165*

U.S. Cl. 324—329 6 Claims

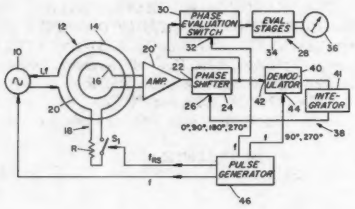
1. Inductive metal object detection apparatus with a search coil consisting of at least an excitation winding and at least one receiver winding, an A.C. current source connected to the

excitation winding to build up a magnetic field in the surroundings, and evaluation circuit apparatus connected to the receiver winding for indicating and evaluating signals induced in the receiver winding by the magnetic field embracing metal objects located in the surroundings, comprising:

a phase regulation circuit which holds the phase angle of an induced signal in a fixed phase relation to a predetermined reference phase angle including,

a selectively controllable phase shifting member having an input, an output and a control signal terminal, said input being connected to the receiving winding and output to the evaluation circuit apparatus;

a phase controlled demodulator having an input connected with the phase shifting member output, an output interconnected with the control signal terminal for the phase shifting member, and a control terminal;



a reference phase transmitter which modifies the coupling between the excitation and receiver windings, said transmitter including a wire loop which is coupled with the excitation winding and receiver winding, and a selectively actuatable switch for opening and closing the wire loop during use of the detection apparatus;

means for actuating the switch on and off at a predetermined frequency; and

a pulse generator having an output interconnected with the control terminal of the demodulator and actuated to provide output signals for controlling the demodulator on the reference phase transmitter being switched on, said output control signals including a signal of a first control phase, occurring during a first control phase period, and a signal of a second control phase differing from said first control phase by 180°, occurring during a second control phase period.

4,881,037

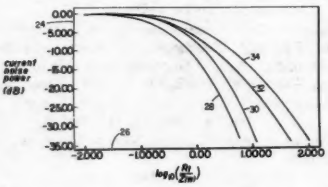
APPARATUS AND METHOD FOR MEASURING THE INTERFACIAL IMPEDANCE IN AN ELECTROCHEMICAL CELL

James G. Bellingham, West Harwich, Mass., and Margaret L. A. MacVicar, West Lebanon, Me., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 26, 1989, Ser. No. 302,420

Int. Cl.[4] G01N *27/00*

U.S. Cl. 324—425 **10 Claims**



8. A method for measuring the interfacial impedance in an electrochemical cell having a pair of electrodes in contact with an electrolyte medium comprising the steps of

determining the intrinsic interaction current flowing between said electrodes as a function of frequency at a series of predetermined external impedance values; and

determining said interfacial impedance based on said interaction current.

4,881,038

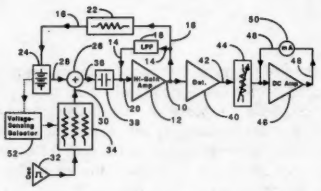
ELECTRIC BATTERY TESTING DEVICE WITH AUTOMATIC VOLTAGE SCALING TO DETERMINE DYNAMIC CONDUCTANCE

Keith S. Champlin, 5437 Elliot Ave. South, Minneapolis, Minn. 55417

Division of Ser. No. 198,484, May 25, 1988, Pat. No. 4,825,170. This application Nov. 18, 1988, Ser. No. 273,957

Int. Cl.[4] G01N *27/46*

U.S. Cl. 324—426 **19 Claims**



1. A process for testing a battery having a dynamic conductance and a nominal voltage comprising the steps of:

a. measuring the battery's dynamic conductance;

b. determining the battery's nominal voltage;

c. automatically scaling the measured dynamic conductance in accordance with the battery's nominal voltage;

d. displaying the scaled result.

4,881,039

TRANSDUCER AND RELATED CIRCUITRY

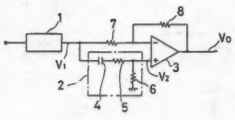
Hideaki Nakamura, Joyo; Tamotsu Shimamori, Nagaokakyo, and Shinichi Murashige, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Company, Nagaokakyo, Japan

Division of Ser. No. 903,976, Sep. 5, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 85,967

Claims priority, application Japan, Sep. 5, 1985, 60-196714; Sep. 27, 1985, 60-215645; Oct. 28, 1985, 60-241808; Oct. 28, 1985, 60-241809

Int. Cl.[4] H03K *5/00*

U.S. Cl. 328—26 **5 Claims**



1. A ripple removal circuit, comprising:

an extraction circuit for extracting an AC component from an original signal containing a ripple therein; and

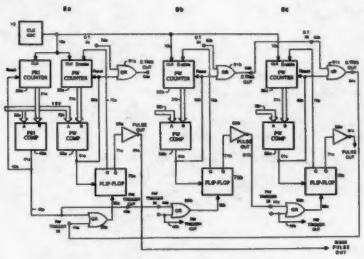
a computing means for receiving the AC component extracted by the extraction circuit and the original signal, and producing a DC output from the original circuit by substracting the AC component from the original signal.

4,881,040

SIGNAL GENERATOR FOR PRODUCING ACCURATELY TIMED PULSE GROUPINGS

Charles J. Vaughn, Fremont, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Aug. 4, 1988, Ser. No. 228,158
Int. Cl.[4] H03K 5/04, 5/135
U.S. Cl. 328—61 14 Claims



1. A pulse generator for producing a repetitive pulse output signal consisting of repetitive pulse groups, each group having as many as three pulses with predetermined pulse widths (PW), and each group having a predetermined/programmable pulse-group repetition interval (PGRI), both of which are time referenced to a clock pulse signal, $f_1(t)$, having a stable rep rate f_c, said pulse generator comprising:

first generator means (**8***a*) for controlling the PGRI and the PW of each pulse in said group, said first generator section comprising:

first counter means (**20***a*) for counting the number of clock pulses in said $f_1(t)$ and for generating a second digital signal, $f_2(t)$, directly related to the number of counted clock pulses, said counter means including first resetting means for resetting said first counter means to a zero count;

second counter means (**30***a*) for counting the number of clock pulses in said $f_1(t)$ and for generating a third digital signal, $f_3(t)$, directly related to the number of counted clock pulses, said second counter means including second resetting means for resetting said second counter means to a zero count and first enabling means for enabling and disabling said second counter means;

first comparator means (**40***a*) for receiving said $f_2(t)$ and for producing a first start-pulse signal at said pulse-group repetition interval by comparing the number of clock pulses represented by $f_2(t)$ with a first predetermined number N_1, where

$$N_1=(PGRI)(f_c),$$

said first start-pulse signal coupled to said first resetting means for resetting said first counter means;

second comparator means (**50***a*) for receiving said $f_3(t)$ and for producing an end-pulse signal when the number of pulses represented by said $f_3(t)$ equals a second predetermined number, N_2, where

$$N_2=(PW)(f_c), \text{ and where } N_2<N_1,$$

said end-pulse signal coupled to said second resetting means for resetting said second counter means;

first gating means (**90***a*) having a single output and a plurality of inputs, a first of said inputs for receiving said first start-pulse signal, said gating means performing an OR-gating function of said inputs and producing a gated start-pulse signal;

first bistable circuit means (**70***a*) for receiving said gated start-pulse signal and for receiving said end-pulse signal, said first bistable circuit means producing said repetitive pulse output signal by generating a first output state when toggled by said gated start-pulse signal and by generating a second output state when toggled by said end-pulse signal, said bistable circuit means thereby generating a single output pulse upon receiving said gated start-pulse signal followed by said end-pulse 47 signal; and,

first coupling means (**72***a*) for coupling said repetitive pulse output signal to said first enabling means for enabling said second counter means when said bistable circuit means is in said first output state and disabling said second counter means when said bistable circuit means is in said second output state; first delay trigger means (**8***b*) for receiving said first start-pulse signal and for generating a second start-pulse signal a predetermined time interval, Δt_1, after said first start-pulse, such that $\Delta t_1 > PW$, said first delay trigger means including second coupling means (**91***b*) for coupling said second start-pulse signal to a second input of said first gating means for toggling said first bistable circuit means, said first bistable circuit means thereby generating the second pulse of each pulse group in said repetitive pulse output signal;

second delay trigger means (**8***c*) for receiving said first start-pulse signal and for generating a third start-pulse signal a predetermined time interval, Δt_2, after said first start-pulse, such that

$$\Delta t_2>(\Delta t_1+PW),$$

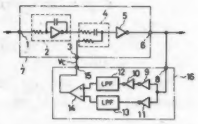
said second delay trigger means including third coupling mens (**91***c*) for coupling said third start-pulse signal to said second input of said first gating means for toggling said first bistable circuit means, said first bistable circuit means thereby generating the third pulse of each pulse group in said repetitive pulse output signal.

4,881,041

PULSE WIDTH DISTORTION CORRECTION CIRCUIT

Yoshihiro Kawanabe, and Kazunaga Ida, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 12, 1988, Ser. No. 192,984
Claims priority, application Japan, May 21, 1987, 62-124420
Int. Cl.[4] H03K 5/22, 5/04, 3/017
U.S. Cl. 328—112 8 Claims



1. A pulse width distortion correction circuit comprising:

a pulse width control circuit to which a digital input signal is applied and providing an output signal having a corrected pulse width; and

a duty ratio detection circuit for detecting a duty ratio of said output signal of said pulse width control circuit and providing a pulse width control signal, said pulse width control circuit being controlled on the basis of said pulse width control signal;

said pulse width control circuit comprising edge smoothing means to which said digital input signal is applied, an adder for adding an output signal of said edge smoothing means to said pulse width control signal, and a logical element to which an output signal of said adder is applied

and providing said output signal of said pulse width control circuit.

4,881,042

AUTOMATICALLY TUNABLE PHASE LOCKED LOOP FM DETECTION SYSTEM

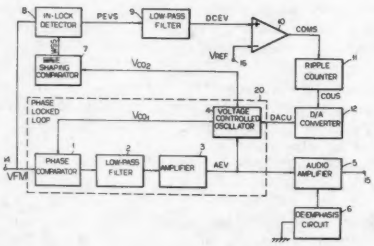
Sung-Ki Min, Inchon; Chan-Kyu Myung, Seoul, and Ki-Ho Shin, Woolsan, all of Rep. of Korea, assignors to Samsung Semiconductor and Telecommunications Co., Ltd., Gumi, Rep. of Korea

Filed Jan. 25, 1988, Ser. No. 147,433

Claims priority, application Rep. of Korea, Jan. 31, 1987, 87-822

Int. Cl.[4] H03D *3/02*

U.S. Cl. 329—326 **2 Claims**



1. A FM detection system using a phase locked loop which includes a phase comparator for comparing the phase differences and frequency differences between a frequency modulated input signaI and first output signal from a voltage controlled oscillator, a low-pass filter for amplifying and converting the output of said phase comparator into a direct current voltage, an amplifier for amplifying the output of said low-pass filter, the output voltage of said amplifier being an input to an audio amplifier and to said voltage controlled oscillator, said audio amplifier being connected to a de-emphasis circuit, said system further comprising:

a wave shaping comparator for accepting a second output signal form said voltage controlled oscillator which is 90? out of phase with said first output signal from said voltage controlled oscillator, said comparator generating an output square wave signal;

an in-lock detector for accepting as inputs said square wave signal and said frequency modulated input signal to provide an output signal including the sum frequency and the difference frequency between said inputs;

a low-pass filter for receiving the output signal from said detector for cutting off said sum frequency component and filtering out said difference frequency signal when said phase locked loop is unlocked;

a comparator for comparing the output of said low-pass filter with a reference voltage and providing a constant logic level when said phase locked loop is locked, or providing a clock pulse corresponding to said difference frequency when said phase locked loop is unlocked;

a ripple counter for accepting and counting said clock pulse and generating a binary signal output in response to the count made;

a D/A converter for accepting said binary output to provide an anologue current; and

the oscillation frequency of said voltage controlled oscillator being controlled in response to said output voltage of said amplifier and said output current of said D/A converter.

4,881,043

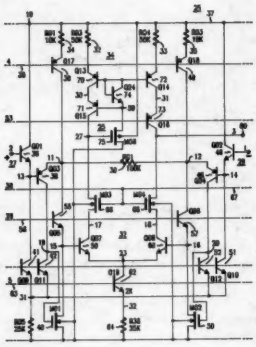
VARIABLE GAIN TRANSCONDUCTANCE AMPLIFIER AND VARIABLE BANDWIDTH FILTER

Barry L. Jason, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 12, 1988, Ser. No. 242,998

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—252 **9 Claims**



5. A low supply voltage, high swing input signal, variable gain transconductance amplifier, comprising:

a pair of complimentary input follower circuits, having complimentary inputs;

an element coupled to each of said follower circuits to provide a signal current in said element in response to a differential input voltage applied to the complimentary inputs of said follower circuits, said signal current element producing differential currents in each of said follower circuits;

a multiplier having a pair of input devices, one each coupled into and forming a common component with each of said follower circuits, said input devices sensing the differential current flowing into follower circuits,

said input devices of said multiplier including a pair of transistors having common connected bases and the multiplier further including a differential pair of transistors having common connected emitters;

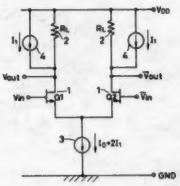
said pair of complimentary input follower circuits including a pair of opposite conductivity transistors connected with the base of a first transistor of said pair forming one of the complimentary inputs, the emitter of the second transistor of said pair being connected to the element, and the emitter of the first transistor being connected to the base of the second transistor; and

a first biased current source coupled to the complimentary input follower circuits and a second biased current source coupled to the multiplier, said second biased current being variable to vary the transconductive gain of said amplifier, the ratio of the first biased current to the second biased current setting the transconductive gain if the amplifier.

4,881,044
AMPLIFYING CIRCUIT

Taizo Kinoshita; Satoshi Tanaka, both of Kokubunji; Hirotoshi Tanaka, Kitatsuru; Nobuo Kotera, Kokubunji, and Minoru Nagata, Kodairashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,790
Claims priority, application Japan, Jan. 16, 1987, 62-5982
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 11 Claims

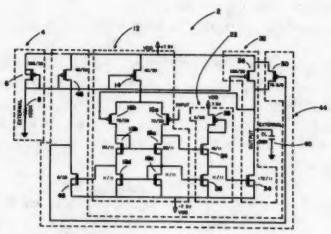


1. A wide-band and high-gain amplifying circuit comprising:
(1) a first FET and a second FET whose sources are differentially connected to each other;
(2) a load means connected to the drain of one of said first FET and said second FET; and
(3) a current by-passing means which is connected to said drain and to said load means, and which permits a current to flow by-passing said load means to increase the conductance of either one of said FET's.

4,881,045
TRANSISTOR AMPLIFIER FOR HIGH SLEW RATES AND CAPACITIVE LOADS

Norman G. Dillman, El Paso, Tex., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 18, 1988, Ser. No. 260,854
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 12 Claims

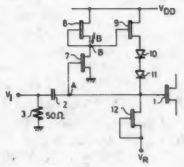


1. An apparatus for providing an improved slew rate in an amplifier, comprising:
first means for providing an error signal using an input signal and an output signal;
second means for providing a threshold and outputting a control signal depending upon the value of said threshold and said error signal;
output means for providing a output signal; and
third means communicating with said control signal and said output means for increasing a slew rate associated with said output signal depending upon said control signal.

4,881,046
MICROWAVE LINEAR AMPLIFIER WITH VERY WIDE PASS BAND

Pham N. Tung, Paris, France, assignor to Thompson Hybrides et Microondes, Paris, France

Filed Nov. 23, 1988, Ser. No. 275,382
Claims priority, application France, Nov. 27, 1987, 87 16466
Int. Cl.[4] H03F *3/16*
U.S. Cl. 330—277 8 Claims

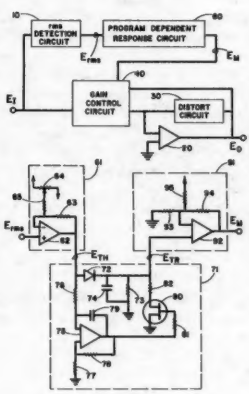


1. A basing circuit, for the biasing at neutral point of the gate of an input transistor wherein said biasing circuit is formed by a BFL type logic circuit comprising:
a inverter formed by a transistor and its active load, powered from a first voltage source;
a shifter formed by a transistor with its gate connected to the drain of the transistor of the inverter, and with its source connected to at least one diode and one transistor which is a current source, the shifter being powered between the first voltage source and a second negative voltage source,
the input signal being applied simultaneously to the gate of the transistor of the inverter and to the gate of the input transistor of the amplifier, and gate of the input transistor being furthermore connected to the output point of the shifter, common to the cathode of the diode and to the drain of the current source transistor.

4,881,047
AUTOMATIC GAIN EXPANSION SYSTEM

James K. Waller, Jr., 174 Morgan Hill, Lake Orion, Mich. 48035

Filed Jun. 20, 1988, Ser. No. 209,176
Int. Cl.[4] H03G *3/30*
U.S. Cl. 330—282 25 Claims



1. A system for amplifying an input signal comprising:
means for deriving a dc signal proportional to said input signal;

means for passing said dc signal when said input signal exceeds a first predetermined level;

means for amplifying said input signal to produce an output signal;

means for distorting said output signal when the gain of said amplifying means exceeds a predetermined rate; and

means responsive to said passed signal for automatically varying the rate of gain of said amplifying means and for establishing a maximum gain of said amplifying means when said input signal exceeds a second predetermined level.

4,881,048

OSCILLATOR FREQUENCY LOCKING AND PREPOSITIONING CIRCUIT

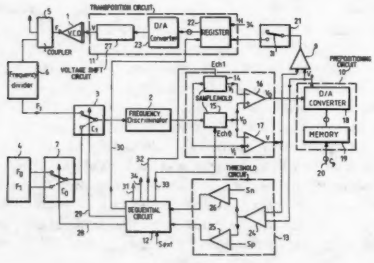
Gisèle Auneau, and Alain Boulanger, both of Brest, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 19, 1989, Ser. No. 298,901

Claims priority, application France, Jan. 22, 1988, 88 00680

Int. Cl.[4] H03L *7/02, 7/16*

U.S. Cl. 331—14 **9 Claims**



1. A frequency locking device for an oscillator of a type with voltage control of frequency of said oscillator, which comprises a frequency discriminator to which there is applied a first frequency signal Fi, having a determined frequency relationship with the frequency Fp of the output signal of said oscillator, said frequency locking device further comprising:

a first generator of a second signal with a frequency Fo;

a second generator of a third signal with a frequency F1;

switching-over means to apply the second and third signals and then the first signal, successively, to the frequency discriminator;

means coupled to an output of said frequency discriminator to give, firstly, a first voltage vo representing the frequency deviation Fo−F1 and, secondly, a second voltage v representing the frequency deviation Fi−Fo;

means to prepare, using the first voltage vo, a control voltage V to be applied to said oscillator to obtain a determined frequency Fp, and

a sequential circuit to prepare control signals for the above-mentioned means.

4,881,049

QAM MODULATOR/DEMODULATOR

Manabu Yagi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,281

Claims priority, application Japan, Apr. 3, 1987, 62-82752

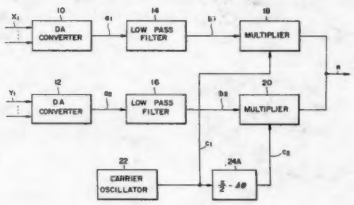
Int. Cl.[4] H04L *27/20, 27/22*

U.S. Cl. 332—103 **8 Claims**

1. A digital signal transmission system comprising:

a modulating device for effecting substantially quadrature amplitude modulation and including a phase shifter which applies phase shift processing to a carrier wave so as to produce two carrier waves which are different in phase from each other; and

a demodulating device for producing a demodulated signal from a received modulated signal by quadramplitude demodulation and including a phase shifter for applying



phase shift processing to a recovered carrier wave so as to produce two recovered carrier waves which are different in phase from each other;

said phase shifters each effecting a phase shift of $(\pi/2-\Delta\theta)$ radian or $(\pi/2+\Delta\theta)$ radian where $\Delta\theta$ is a predetermined phase angle.

4,881,050

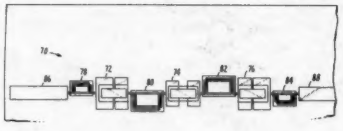
THIN-FILM MICROWAVE FILTER

Daniel G. Swanson, Jr., Mountain View, Calif., assignor to Avantek, Inc., Milpitas, Calif.

Filed Aug. 4, 1988, Ser. No. 228,288

Int. Cl.[4] H03H *7/00*

U.S. Cl. 333—185 **8 Claims**



1. A thin-film filter comprising:

a planar dielectric substrate having a ground plane on one side thereof; and

first and second thin-film metal layers and an insulation layer therebetween disposed on the side of the dielectric substrate opposite the ground plane and forming one or more electrically interconnected capacitive pi networks and spiral inductors, wherein the capacitive pi networks and inductors are lumped elements;

wherein each capacitive pi network includes two pads of the first metal layer separated by a gap, and includes an overlying region of the second metal layer overlapping the two pads of the first metal layer and separated from at least one pad by the insulation layer, wherein each pad provides an electrical connection to the capacitive pi network; and

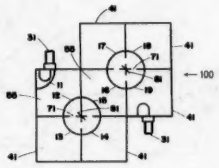
wherein each spiral inductor includes a first trace of the first metal layer looped into a coil and ending at an interior end, includes a second trace of the first metal layer disposed adjacent to the first trace, and includes a connecting bridge of the second metal layer contacting the interior end of the first trace and the second trace while bridging over an intermediate portion of the first trace and separated therefrom by the insulation layer, wherein each trace provides an electrical connection to the inductor.

4,881,051

DIELECTRIC IMAGE-RESONATOR MULTIPLEXER

Wai-Cheung Tang, Kitchener, Canada; Richard J. Cameron, High Wycombe, and David M. T. Bryant, Abbots Langley, both of England, assignors to Com Dev Ltd., Cambridge, Canada

Filed Aug. 3, 1988, Ser. No. 227,788
Claims priority, application Canada, Apr. 5, 1988, 563315
Int. Cl.[4] H01P 1/20
U.S. Cl. 333—208 26 Claims



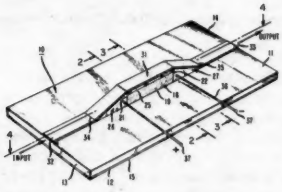
1. A multiplexer comprising two, three or four channels, each channel having one bandpass filter, each filter having at least one cavity, said at least one cavity of each filter being a common cavity with all of the other filters of the multiplexer, said common cavity containing one independent dielectric cut image resonator for each filter representing a channel of said multiplexer, each resonator being mounted on a suitable support, said common cavity providing a common junction and containing a means to couple electromagnetic energy between the various channels, said multiplexer having at least one input and at least one output.

4,881,052

MILLIMETER WAVE MICROSTRIP NONRECIPROCAL PHASE SHIFTER

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1988, Ser. No. 280,055
Int. Cl.[4] H01P 1/195
U.S. Cl. 333—24.1 7 Claims



1. A microstrip nonreciprocal phase shifter comprising

a length of microstrip transmission line dielectric substrate having a pair of ends and top and bottom planar surfaces;

an electrically conductive ground plane mounted on the bottom surface of said substrate;

a rectangular ferrite rod having four sides and a pair of ends mounted on the top surface of said substrate with one of said rod sides abutting said substrate top surface and with said rod ends spaced a distance from the ends of said length of substrate, said rod having a dielectric constant greater than the dielectric constant of said substrate and a passageway therein extending along the longitudinal axis of the rod for at least a portion of the length of the rod so that the rod has a toroidal-shaped portion surrounding said passageway and extending the length of the passageway, said toroidal-shaped rod portion having a pair of walls disposed on opposite sides of said passageway which are substantially normal to said first-named rod side;

a dielectric waveguide core member disposed in said rod passageway and extending the length of said passageway, said dielectric core member having a dielectric constant which is at least as great as the dielectric constant of said rod;

a dielectric plate mounted on a second side of said rod which is parallel to said first-named rod side, said plate extending the length of the rod so that the ends of the plate are located at the ends of said rod and having a dielectric constant which is substantially the same as the dielectric constant of said substrate;

a pair of ramp-shaped dielectric waveguide members mounted on the top surface of said substrate at the ends of said rod, each of said ramp-shaped members having dielectric constant which is substantially the same as the dielectric constant of said rod, a width which is substantially the same as the width of said rod, a planar bottom surface abutting the top surface of said substrate, an end surface abutting the end of said rod and the end of said plate adjacent thereto and a downwardly-sloping top surface extending between the end of said plate adjacent thereto and the top surface of said substrate;

electrically conductive microstrip conductor means mounted on the top surface of said plate, the top surface of said pair of ramp-shaped dielectric waveguide members and the top surface of said substrate in alignment with the longitudinal axis of said rod and extending between the ends of said length of substrate; and

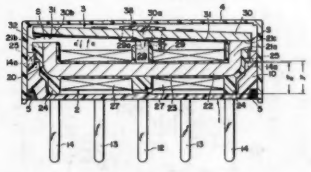
selectively operable control wire means extending through said dielectric waveguide core member along the longitudinal axis of said rod for creating a reversible circular magnetic field in said toroidal-shaped portion of said rod surrounding said dielectric waveguide core member so that said rod acts as a twin wall latching nonreciprocal phase shifter with respect to electromagnetic wave energy traveling along said microstrip conductor means between the ends of said microstrip conductor means.

4,881,053

ELECTROMAGNETIC RELAY

Takashi Tanaka, Takatsuki; Takezo Sano, Shiga, and Tsutomu Shimizu, Kusatsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 11, 1988, Ser. No. 167,192
Claims priority, application Japan, Mar. 13, 1987, 62-59561
Int. Cl.[4] H01H 51/22
U.S. Cl. 335—80 9 Claims



1. An electromagnetic relay comprising an electromagnetic block with a roughly U-shaped iron core formed with a pair of bent opposing magnetic poles at both the ends thereof and with a coil wound therearound via a spool; and an armature block having an armature with both ends thereof opposing the magnetic poles and with the middle portion thereof pivotally supported, to bring or separate a movable contact provided for said armature block into contact with or away from a fixed contact by pivoting said armature block on the basis of energization and deenergization of said electromagnetic block, wherein a permanent magnet is disposed immediately adjacent

to the center of the iron core between the two opposing magnetic poles thereof so as to oppose said armature; said permanent magnet is supported by a support member formed integral with said spool of said electromagnetic block; the coil is wound around spool between said permanent magnet and each of said magnetic poles; and said armature is pivotally supported by said electromagnetic block.

4,881,054

RELAY DRIVE FOR POLARIZED RELAY

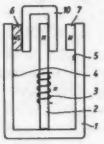
Tibor Polgar, Maria Enzersdorf, Austria, assignor to Schrack Elektronik-Aktiengesellschaft, Vienna, Austria

Filed Aug. 26, 1988, Ser. No. 236,920

Claims priority, application Austria, Aug. 27, 1987, 2164/87

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—230 **14 Claims**



1. A relay drive for a polarized relay, comprising:

a split yoke having a plurality of limbs;

an armature moveably disposed between said limbs of said yoke;

coil means for inducing a magnetic field within said yoke;

a first flux guide magnetically coupled to said yoke and comprising a permanent magnet, one pole face of said permanent magnet defining a first pole face; and

a second flux guide, detachably mounted within said relay, magnetically coupled to said yoke and directly defining a second pole face;

said first and second pole faces at least partially defining at least one air gap, said air gap permitting movement of said armature between said limbs of said yoke.

4,881,055

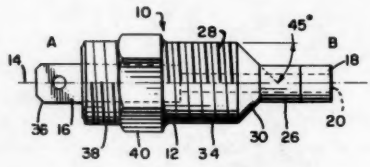
HIGH-TEMPERATURE-FLUID SENSOR

F. William Capp, Winston-Salem; Don J. Gerhardt, Clemmons, and Randal A. Little, Mocksville, all of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 10, 1988, Ser. No. 269,707

Int. Cl.[4] H01H *37/76*

U.S. Cl. 337—404 **17 Claims**



1. A high-temperature-fluid sensor, with a fusible detector, comprising:

a body having a longitudinal axis; and

a pair of electrical conductors, confined within said body, lying generally parallel with said axis; wherein

portions of said conductors, of said pair thereof, project from opposite axial ends of said body; and including

fusible, electrically conductive material engaged with, and electrically bridging between those said conductors' portions which project from one of said axial ends of said body; wherein

said conductors' portions, which project from said one end of said body, are spaced-apart, in juxtaposition, defining a void therebetween;

a buffer, of electrically non-conductive material, is confined within said void; and

said buffer has means formed therein for securing said fusible material thereto.

4,881,056

FACEDOWN-TYPE SEMICONDUCTOR PRESSURE SENSOR WITH SPACER

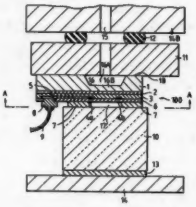
Masahito Mizukoshi, Nagoya; Eishi Kawasaki; Takeshi Miyajima, both of Kariya, and Takeshi Fukazawa, Tokyo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 11, 1988, Ser. No. 180,134

Claims priority, application Japan, Apr. 9, 1987, 62-87696; Jul. 7, 1987, 62-169283

Int. Cl.[4] G01L *1/22*

U.S. Cl. 338—4 **28 Claims**



1. A facedown-type semiconductor pressure sensor comprising:

(a) a sensing element having:

(i) a semiconductor substrate having in one surface a recess for receiving an applied pressure to be measured, said recess being formed such that a thin portion is provided in said semiconductor substrate at a place corresponding to a bottom of said recess;

(ii) layer means formed on the other surface of said semiconductor substrate, said thin portion and a portion of said layer means corresponding to said thin portion forming a diaphragm;

(iii) a spacer having a hole therein formed on said layer means, said hole being substantially coaxial with said recess;

(iv) piezoresistive means embedded in said diaphragm to produce an output in accordance with displacement of said diaphragm caused by application of the pressure to be measured; and

(v) electrode means connected to said piezoresistive means for obtaining the output from said piezoresistive means, and

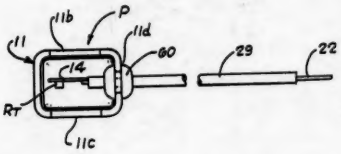
(b) a pedestal to which said spacer is fixed such that a pressure chamber is defined by said hole and a surface of said pedestal, said pedestal supporting said layer means through said spacer.

4,881,057

TEMPERATURE SENSING APPARATUS AND METHOD OF MAKING SAME

Richard R. Garcia, and Royal H. Sites, both of Plano, Tex., assignors to Ranco Incorporated, Dublin, Ohio

Filed Sep. 28, 1987, Ser. No. 101,656
Int. Cl.[4] H01C 3/04
U.S. Cl. 338—28 19 Claims



1. A method of manufacturing a temperature sensor comprising the steps of:

forming a voltage divider having first and second connected segments wherein forming said first segment comprises mounting a thermistor element having a resistance that varies with temperature on a substrate and forming said second segment comprises depositing a monolithic resistor element onto the substrate;

measuring the resistance of the thermistor element at a reference temperature and recording the measured resistance; and

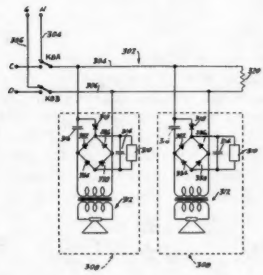
precisely trimming the monolithic resistor element to produce a precise resistance ratio between the first and second segments at said reference temperature.

4,881,058

COMBINED AUDIBLE AND VISUAL ALARM SYSTEM

Robert W. Berry, III, Bridgeport, Conn., assignor to Audiosone, Inc., Stratford, Conn.

Filed Oct. 25, 1988, Ser. No. 262,459
Int. Cl.[4] G08B 27/00
U.S. Cl. 340—326 25 Claims



1. A combination audio and visual alarm system for selectively generating either audible, or visual, or combined audible and visual alarm signals, comprising in combination:

(a) signal generating means for producing an audio signal on a pair of output terminals thereof,

(b) a two-wire transmission line connected to said output terminals,

(c) a unit containing a sound transducer and a polarity-responsive electrical lamp, and

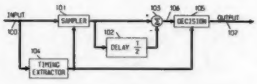
(d) means connected with said signal generating means, said transmission line, said sound transducer and said lamp, for selectively activating either the sound transducer by itself to be driven by the signal generating means, or the lamp by itself, or both the sound transducer and lamp simultaneously to be driven by the signal generating means.

4,881,059

MANCHESTER CODE RECEIVER

Burton R. Saltzberg, Middletown, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 44,267, Apr. 30, 1987, abandoned. This application Dec. 30, 1987, Ser. No. 143,244
Int. Cl.[4] H03M 5/12
U.S. Cl. 341—70 10 Claims



1. A Manchester code receiver comprising

input means for receiving a Manchester encoded data signal,

sampling means for generating samples of said data signal,

delay means connected to said sampling means for delaying said data signal samples by a predetermined fraction of the time period of said data signal, and

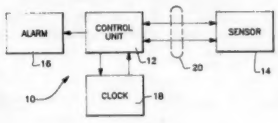
subtracter means for subtracting a delayed data sample outputted from said delay means from said data signal sample generated by said sampling means.

4,881,060

FIRE ALARM SYSTEM

Joseph M. Keen, Crystal Lake, and David S. Schiller, Hawthorn Woods, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 16, 1988, Ser. No. 272,174
Int. Cl.[4] G08B 29/00
U.S. Cl. 340—511 20 Claims



1. In a fire detection system of the type including at least one sensor for sensing the level of a parameter of a fire condition such as heat or smoke density and which transmits electrical signals indicative of the sensed levels over a communication link, an alarm system for indicating a first alarm condition comprising:

control means coupled to said communication link for receiving said electrical signals from said sensor,

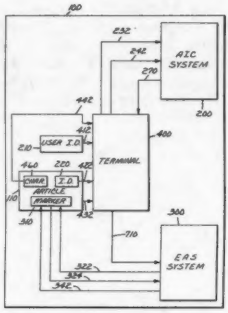
clock means responsive to said control means for keeping time from the time that said parameter reaches a first level and

alarm means responsive to said control means for indicating said first alarm condition when said parameter reaches a second level from said first level within a predetermined time period, said second level having a magnitude greater than said first level.

4,881,061
ARTICLE REMOVAL CONTROL SYSTEM

David C. Chambers, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 5, 1988, Ser. No. 279,531
Int. Cl.[4] G06F 7/06
U.S. Cl. 340—568 14 Claims



1. An article removal control system for enabling removal of a given article only by a given authorized user from a facility which has:

(a) an article inventory control system which responds to inputs including user identification data and article identification data to issue an article removal authorization signal, and

(b) an electronic article surveillance system which controls removal of the article by detecting within an interrogation zone a sensitized electronically detectable marker secured to the article;

the article removal control system comprising:

(c) an article removal authorization signal receiver and

(d) means responsive to the article removal authorization signal for initiating removal of the given article, comprising

(1) a measurer of a characteristic of the given article,

(2) a receiver of a coded input signal representing the measured characteristic,

(3) a comparer of the measured characteristic and the coded input signal, which produces a verification signal if they are substantially equal, and

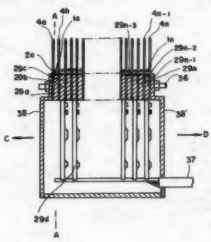
(4) an enabler which upon receipt of the verification signal enables the initiation of the removal of the given article.

4,881,062
YARN BREAK DETECTOR FOR SPINNING AND WEAVING MACHINES

Syozaburo Makino, Kanagawa, and Shouji Hirabayashi, Gifu, both of Japan, assignors to Nippon Selen Co., Ltd., Kanagawa, Japan

PCT No. PCT/JP87/00959, § 371 Date Jun. 23, 1988, § 102(e) Date Jun. 23, 1988, PCT Pub. No. WO88/04644, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 10, 1987, Ser. No. 219,153
Claims priority, application Japan, Dec. 15, 1986, 61-298012
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—677 2 Claims

1. A yarn break detector comprising sensor electrodes disposed in correspondence to a plurality of closely arranged yarns so that a change of electric charge of yarn will be induced therein, high-input-resistance amplifiers each of which amplifies the varied potential induced in a corresponding one of said sensor electrodes and issues an output signal by discriminating between run and stoppage of said yarn, grounded conductive separators adapted for shielding said sensor lectrodes from any electric field while guiding said yarns, and a logic circuit having inputs connected to the outputs of corresponding ones of said high-input-resistance amplifiers, wherein each of said yarns is let run between two adjoining separators and

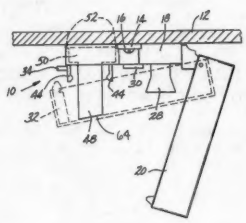


when any of said yarns is caused to stop running, a signal is issued from the output of said logic circuit to stop the machine processing said yarns while giving an alarm.

4,881,063
BATTERY REMOVAL INDICATOR

Keith Fawcett, Limerick, Ireland, assignor to EI Company, Ltd., Shannon, Ireland

Filed Jan. 30, 1989, Ser. No. 302,913
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—693 15 Claims



1. A battery removal indicator for use in a battery operated unit which includes a base member, at least one battery operated device attached to said base member, and a cover hingedly mounted to said base member for rotation about a first axis, said indicator comprising spring loaded means for preventing said cover from closing and for providing a separate visual indication that a battery is not present in said unit.

4,881,064
INFORMATION PROCESSOR HAVING CURSOR DISPLAY SYSTEM AND CONTROL

Tsutomu Nishino, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 702,679, Dec. 19, 1985, abandoned. This application Sep. 4, 1987, Ser. No. 94,087
Claims priority, application Japan, Feb. 23, 1984, 59-31445
Int. Cl.[4] G09G 3/00
U.S. Cl. 340—709 11 Claims

1. An information processor comprising:

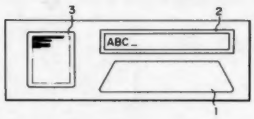
designation means for designating a cursor position,

memory means for storing information;

display means including a first display unit for displaying in dot form corresponding to a visual format information stored in said memory means and a second display unit for displaying in character form a portion of the information stored in said memory means;

cursor memory means for storing a cursor position designated by said designation means; and

cursor display means for displaying a cursor on said second display unit whenever the cursor position stored in said cursor memory means is designated in a position included



in the portion of information displayed on the second display unit and for displaying a cursor on the first display unit whenever the cursor position stored in said cursor memory means is not designated in a position included in the portion of information displayed on the second display unit.

4,881,065

X-Y POSITION INPUT APPARATUS INCLUDING PREVENTING DUST INTERFERENCE

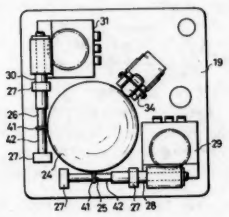
Masahiro Soma, Furukawa, and Shinya Tanaka, Yokohama, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 31, 1987, Ser. No. 139,906

Claims priority, application Japan, Apr. 28, 1987, 62-63433[U]

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—710 **6 Claims**



1. An X-Y input apparatus comprising: a ball freely rotatably arranged;

a first rotating shaft, having a large diameter portion and having a first contact portion, rotated by a rotating force caused by said first contact portion being in contact with said rotatable ball, said first contact portion having a diameter larger than the portions of said first rotating shaft adjacent thereto and having a diameter smaller than said large diameter portion and said first contact portion further having a first stepped portion connecting said first contact portion to said adjacent portions;

a second rotating shaft, having a large diameter portion and having a second contact portion, having an axis of rotation substantially perpendicular to an axis of rotation of said first rotating member, and rotated by a rotating force caused by said second contact portion being in contact with said rotatable ball, said second contact portion having a diameter larger than the portions of said second rotating shaft adjacent thereto and having a diameter smaller than said large diameter portion, and said second contact portion further having a second stepped portion connecting said second contact portion to said adjacent portions;

first rotation-angle detecting means for detecting a rotation angle of said first rotating shaft;

second rotation-angle detecting means for detecting a rotation angle of said second rotating shaft; and

a casing for storing said rotatable ball, first and second rotating shafts, and first and second rotation-angle detecting means therein,

said rotatable ball partially projecting from an opening formed on a lower plane of said casing, resulting in performing X-Y input operation.

4,881,066

ACTIVE MATRIX-TYPE DISPLAY PANEL

Hideo Kanno; Shinichi Yamashita, both of Kawasaki; Satoshi Omata, Tokyo; Masahiko Enari, Yokohama; Mitsutoshi Kuno, Kawasaki, and Yoshiyuki Osada, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

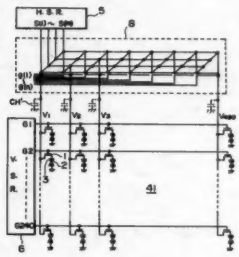
Continuation of Ser. No. 799,107, Nov. 18, 1985, abandoned.

This application Jun. 20, 1988, Ser. No. 220,898

Claims priority, application Japan, Nov. 19, 1984, 59-242268

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—719 **6 Claims**



1. An active matrix-type display panel, comprising:

a liquid crystal panel comprising:

a first base plate having thereon:

a plurality of thin film transistors arranged in the form of a matrix comprising rows and columns;

a plurality of horizontal lines each commonly connected to the gates of thin film transistors in a row;

a plurality of vertical lines each commonly connected to the sources of the thin film transistors in a column; and

a plurality of pixel electrodes each connected to the drain of a thin film transistor;

a second base plate having thereon a counter electrode; and

a liquid crystal disposed between the first and second base plates;

a scanning-side driving circuit provided with a first shift register;

an information-side driving circuit provided with a second shift register;

a plurality of capacitive elements respectively connected to the vertical lines for sampling-and-holding information signals, each capacitive element being formed between one of the vertical lines and the counter electrode with the liquid crystal disposed therebetween and having a capacitance at least thirty times the capacitance formed between one pixel electrode and the counter electrode with the liquid crystal disposed therebetween;

a plurality of analog switching transistors disposed between said second shift register and said capacitive elements for holding the information signals at said respective capacitive elements for one scanning period for scanning a row of the transistors; and

said plurality of analog switching transistors being divided into a plurality of blocks each comprises a plurality of

analog switching transistors≥the gates of which are commonly connected to a switching line, and the sources of which are connected to data lines leading to the second shift register in such a manner that the sources of the analog switching transistors in each block are respectively connected to one of the data lines, and wherein a group of the sources of the analog switching transistors each belonging to a different block are commonly connected to one of the data lines.

4,881,067

IMAGE FORMING APPARATUS AND METHOD

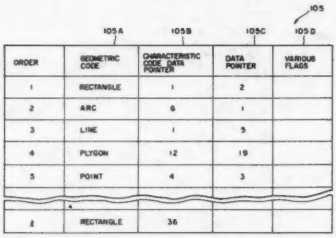
Osamu Watanabe, Tokyo; Kosuke Komatsu, Kanagawa; Masaichi Ishibashi, Saitama; Mutsumi Kimura, Tokyo; Shinsuke Koyama, Tokyo; Takahiro Fujimori, Tokyo; Tadashi Fujiwara, Tokyo, and Junko Kuroiwa, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 26, 1985, Ser. No. 801,826

Claims priority, application Japan, Nov. 30, 1984, 59-253659

Int. Cl.⁴ G09G *1/14*

U.S. Cl. 340—750 **12 Claims**



1. An image forming apparatus for dealing with videotex codes consisting of a sequential arrangement of geometric codes representing individual image areas as respective geometric drawings and also characteristic codes representing attributes of said geometric drawings, said apparatus comprising:

means for effecting transmission of said geometric codes and characteristic codes;

an order table for supervising the order of transmission of said geometric codes and characteristic codes;

a characteristic code table communicating with said order table and enabling selection of said characteristic codes; and

means for analyzing data in said tables and effecting changes therein.

4,881,068

THREE DIMENSIONAL DISPLAY APPARATUS

Eric J. Korevaar, 7506 Charmant Dr. #825, San Diego, Calif. 92122, and Brett Spivey, 131 Seeman, Encinitas, Calif. 92024

Filed Mar. 8, 1988, Ser. No. 165,543

Int. Cl.⁴ G09G *3/06*

U.S. Cl. 340—766 **16 Claims**

1. A three-dimensional visual display apparatus comprising:

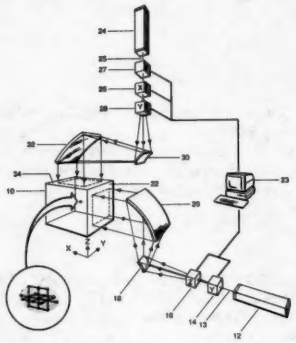
(a) a sealed chamber having one or more walls which are transparent to visible light,

(b) a single active element gas contained in said sealed chamber comprised of atoms or molecules having a ground state and a first excitation state having an excitation energy above said ground state, the difference defining a first energy level and a second excitation state having an excitation energy above said ground state, the difference defining a second energy level, which said second excitation state relaxes with the release of visible light,

(c) a first laser means for producing a first beam of laser radiation comprised of photons having energy equal or approximately equal to said first energy level,

(d) a second laser means for producing a second beam of laser radiation comprised of photons having energy equal to or approximately equal to the difference between said second eneryy level and said first energy level,

(e) means for rapidly moving and directing said first laser beam and said second laser beam so as raise the energy



level of a substantial portion of the atoms in small volumes of said gas to said first energy level with said first laser beam and so as to further raise the energy level of a substantial portion of the atoms in portions of said small volumes to said second energy level with said second laser beam so as to produce small volume sources of visible light which in combination, produce what appears to the human eye as a three-dimensional display.

4,881,069

FONT COMPRESSION METHOD AND APPARATUS

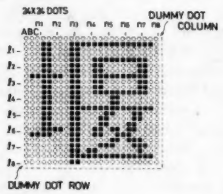
Kazuyoshi Kameda; Koichi Kaji, both of Yokohama; Hiroshi Yahiro, Yokosuka, and Kenichiro Kobayashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 760,513, Jul. 30, 1985, abandoned. This application Dec. 15, 1987, Ser. No. 134,552

Claims priority, application Japan, Nov. 15, 1984, 59-240982

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—735 **11 Claims**



1. A font compression method for compressing a first type font of characters and figures arranged in an XY dot matrix into a second type font of the same characters, arranged in a second NM dot matrix by dropping predetermined dots in the column and row directions of the XY dot matrix, comprising the steps of:

(a) dividing said XY dot matrix into a plurality of sections comprising a predetermined number of bit positions along the columns and rows of said first type font;

(b) adding at least one dummy dot column and /or one dummy dot row to the final column and the final row of said XY matrix, so as to carry out a bit comparison of the final bit in the final section with the dummy dot of the XY matrix;

(c) comparing bit by bit information bits existing in the different specific bit positions in each one section and a first bit position of each of the adjacent next section with each other;

(d) dropping at least one information bit in a specified bit position in each section respectively in accordance with the result of each comparison and extracting a pair of specific information bits in specific positions in each section as compressed information bits from possible combinations of information bits; and

(e) repeating the operation of the steps (c) and (d) starting from the first section to the last section plus one dummy dot and then to the next row, until the last section of row plus one dummy dot has been reached, so as to extract each pair of compressed information bits, thereby obtaining the compressed font of the second type having a good compression quality arranged in the NM matrix from information bits thus extracted.

4,881,070

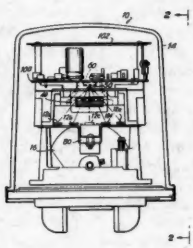
METER READING METHODS AND APPARATUS

David E. Burrowes, and Alan W. Holmes, both of Dayton, Ohio, assignors to Energy Innovations, Inc., Dayton, Ohio

Continuation of Ser. No. 253,438, Oct. 5, 1988, abandoned, which is a continuation of Ser. No. 909,851, Sep. 22, 1986, abandoned, which is a division of Ser. No. 747,243, Jun. 21, 1985, Pat. No. 4,646,084. This application Mar. 22, 1989, Ser. No. 327,360

Int. Cl.[4] H04Q *9/02*

U.S. Cl. 340—870.02 **4 Claims**



1. A meter associated with and disposed at the premises of a customer who is consuming a service or commodity supplied to said premises from a remote location via a service or commodity channel which extends from said remote location to said premises comprising:

means for determining the rate at which said service or commodity is currently being consumed at said premises;

means for receiving from a remote location an input signal indicative of a maximum allowable rate of consumption of said service or commodity at said premises;

means responsive to said input signal for storing said maximum allowable rate;

means for comparing said rate at which said service or commodity is currently being used with said maximum allowable rate; and

means for producing an output signal indicative of whether or not said rate at which said service or commodity is currently being used is greater than said maximum allowable rate.

4,881,071

TRANSDUCER FOR MEASURING ONE OR MORE PHYSICAL QUANTITIES OR ELECTRIC VARIABLES

Gianpaolo Monterosso, Milan; Riccardo Marazzi, Vaprio D'Adda; Mario Nicotra, Segrate, and Luciano Manenti, Gussago, all of Italy, assignors to Nicotra Sistemi S.p.A., Pero, Italy

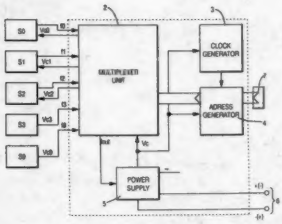
Continuation-in-part of Ser. No. 70,808, Jul. 7, 1987, abandoned. This application Nov. 16, 1987, Ser. No. 120,839

Claims priority, application Italy, Jul. 24, 1986, 21245 A/86

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[4] H04Q *11/00*

U.S. Cl. 340—870.13 **8 Claims**



1. A transducer for measuring one or more conventional physical quantities and electric variables, comprising:

at least one sensor, each of said at least one sensor detecting either a physical quantity or an electric variable, and outputting a frequency signal having a frequency which is proportional to a level of either said detected physical quantity or said detected electric variable;

a multiplexer unit for selecting and enabling said at least one sensor according to a coded address assigned to each of said at least one sensor, and for transmitting each said frequency signal received from each of said at least one sensor;

an address generator for forming and delivering to said multiplexer unit each said coded address assigned to each of said at least one sensor;

a clock generator connected to said multiplexer unit through said address generator, for controlling a rate of operation of said multiplexer unit and said address generator;

a power supply unit for delivering an operating voltage to said multiplexer unit, said clock generator, and said address generator; and,

a single loop for supplying electric power to said power supply unit and for delivering each said frequency signal transmitted from said multiplexer unit.

4,881,072

DEVICE FOR REMOTE METERING

Alain Carnel, Poitiers, France, assignor to Electricite de France, Paris and Service National and Enertec, Montrouge, both of, France

Filed Mar. 9, 1987, Ser. No. 23,355

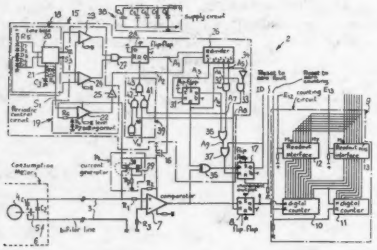
Claims priority, application France, Mar. 7, 1986, 86 03271

Int. Cl.[4] H04Q *9/00*

U.S. Cl. 340—870.020 **12 Claims**

1. Device for remote measuring, comprising measuring means for measuring a consumption, transmission means for transmitting information, which transmission means is suitable for transmitting information relating to quantities consumed, and consisting essentially of modulating means and of a bifilar line, said measuring means and said modulating means being connected to a first end of said bifilar line, and counting means for counting said information, which counting means is disposed at a second end of the line, characterized in that said modulating means comprises capacitive means (6) connected

to the bifilar line and switching means (5) which is actuated by the measuring means (4) to modify correlatively the value of the total capacitance which is represented, for a signal passing along the bifilar line, by said capacitive means, and in that this device further comprises, on the counting means end of said bifilar line, a current generator (14) to apply a load current



pulse to the bifilar line, and detecting means (7) which is connected to the line (3) and which is adapted for distinguishing, as a function of the rise time of the voltage on this line in response to said current pulse, at least two states of the modulating means and one state corresponding to possible cutting and/or to a possible short-circuit of the transmission means.

4,881,073

PAGING SYSTEM WITH DYNAMICALLY PROGRAMMABLE RECEPTION FREQUENCIES

Andrew A. Andros, Spring, Tex., and Thomas J. Campana, Jr., Chicago, Ill., assignors to Telefind Corp., Miami, Fla.

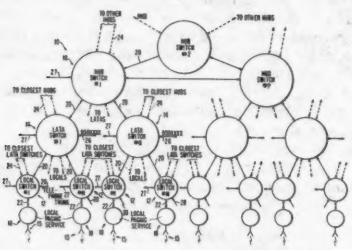
Filed Feb. 22, 1988, Ser. No. 158,931

Int. Cl.[4] H04Q *7/00*; H04B *7/02*

U.S. Cl. 340—825.440 **30 Claims**

MICROFICHE APPENDIX INCLUDED

(274 Microfiche, 3 Pages)



30. A paging system including a paging service, a plurality of subscriber files, each subscriber file identifying a subscriber of the paging service by an identification number and a transmitter for transmitting pages on at least one radio common carrier channel, and at least one additional paging means which transmits pages to subscribers of the paging means on at least one non-radio common carrier channel, the paging service transmitting a channel programming command by RF transmission from the transmitter to a paging receiver, including a paging receiver identification code, and specifying a change in RF channel to be received by a paging receiver receiving the channel programming command comprising:

(a) means for generating a signal to initiate the generation of a channel programming command for changing at least one channel of a paging receiver the channel programming command in response to a communication containing an identification number of a subscriber identified within the subscriber files; and

(b) means, responsive to the means for generating a signal, for generating the channel programming command to cause the paging receiver to which the channel programming command is addressed to receive pages on the at least one radio common carrier and causing the transmitter to transmit the channel programming command to the paging receiver.

4,881,074

METHOD FOR FORMING AN ADDRESS TABLE IN A RING-SHAPED COMMUNICATIONS NETWORK

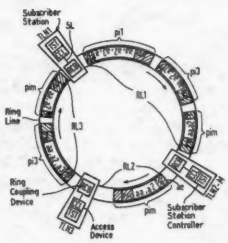
Hermann Reichbauer, Munich; Rudi Mueller, Groebenzell, and Aldo Riccato, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,691

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716177; Mar. 4, 1988, 3807146

Int. Cl.[4] H04J *3/26, 1/16*

U.S. Cl. 340—825.05 **15 Claims**



1. A method for forming an address table in a token ring network having a plurality of subscriber stations, each having an address, among which information is transferred by transmission, in a transmission direction, of data packets consisting of the token and a frame, said method comprising the steps, after each configuring of a network, of:

(a) forming, in a first subscriber station a temporarily monitoring said network, a frame including an address signaling request, an address recognition bit having a selected binary state, and an information field including the address of said first subscriber station;

(b) broadcasting, from said first subscriber station, data packet including the frame formed in step (a);

(c) changing the state of said address recognition bit in each subscriber station upon receipt of a data packet addressed to it with said address recognition bit in said selected binary state, and returning the data packet, otherwise unchanged, to the network;

(d) forming, in each subscriber station after receipt of a data packet with an address recognition bit in said selected binary state, a further data packet having a frame including an address recognition bit having said selected binary state, an address signal request, and an information field including the contents of the information field in the received data packet with the address recognition bit in the selected binary state plus the address of the subscriber station immediately following, in the transmission direction, the last address in said contents;

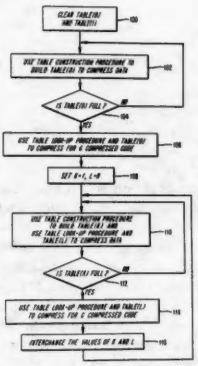
(e) upon receipt by said first subscriber station of a data packet with an address recognition bit in said selected binary state, entering the address or addresses in the information field of the received data packet with the address recognition in said selected binary state into an address table in said first subscriber station; and

(f) monitoring the network with said first subscriber station using said address table.

4,881,075
METHOD AND APPARATUS FOR ADAPTIVE DATA COMPRESSION

Lih-Jyh Weng, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 15, 1987, Ser. No. 108,892
Int. Cl.[4] H03M *7/30*
U.S. Cl. 341—87 **28 Claims**



1. A method for compressing input data symbol signals to generate a stream of code value signals constituting a compressed form of the input data symbol signals, the method comprising:

a first step of loading a first translation table in memory with data symbol signals;

a second step of loading a second translation table in memory with input data symbol signals according to a predetermined table construction procedure;

a third step of generating a stream of the code value signals representative of input data symbols according to a predetermined data compression procedure using the contents of the first table;

a fourth step of loading the first table with the input data symbol signals according to the same predetermined table construction procedure as used in the second step;

a fifth step of generating a stream of the code value signals representative of input data symbols according to the same predetermined data compression procedure as used in the third step using the contents of the second table; and

a sixth step of repeatedly performing the second through fifth steps.

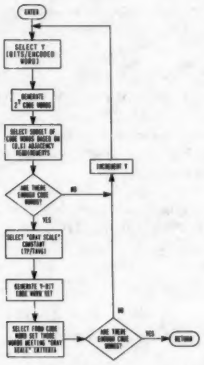
4,881,076
ENCODING FOR PIT-PER-TRANSITION OPTICAL DATA RECORDING

Jonathan J. Ashley, Peekskill, N.Y.; Mark G. Call, Longmont, Colo., and Paul H. Siegel, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1987, Ser. No. 126,653
Int. Cl.[4] H03M *7/16*
U.S. Cl. 341—95 **8 Claims**

1. A method of generating y-bit words especially suitable for PPT or RZ recording techniques comprising the steps of:

selecting from the set of 2^y possible ybit words a subset to be recorded using pit-per-transition recording techniques according to predetermined characteristics including adjacency requirements; and

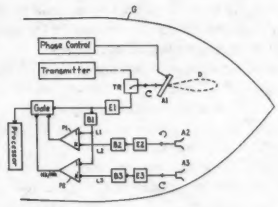


choosing from said subset code words producing a predetermined gray scale greater than zero and less than one-half.

4,881,077
RADAR ARRANGEMENT

Franz Jehle, Ulm; Martin König, Günzburg, and Erwin Wölfle, Ehingen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 719,316, Apr. 3, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,106
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414158
Int. Cl.[4] G01S *13/94, 13/95*
U.S. Cl. 342—26 **8 Claims**



1. A radar arrangement comprising, transmitter means for supplying a circularly polarized signal being circularly polarized in a first direction, a directional antenna connected to said transmitter means for receiving said signal and transmitting a circularly polarized directional pattern which is circularly polarized in the first direction, a supplementary non-directional antenna which is sensitive to circularly polarized signals in an opposite direction to said circularly polarized signals being polarized in a first direction, said directional antenna being more sensitive to circularly polarized signals in the first direction than to circularly polarized signals in the opposite direction, a level comparator means connected to said directional antenna and said supplementary antenna for comparing the level of the signals of the directional antenna and the level of the signals from the supplementary non-directional antenna to each other for determining if the ratio of the level of the signals of the directional antenna to level of the signals of the supplementary non-directional antenna differs from a predetermined ratio of the directional antenna sensitivity to the supple-

mentary non-directional sensitivity providing n indication of echo signals which are due to rain.

4,881,078

TRACKING SYSTEM WITH BEAM SWITCHING ANTENNA

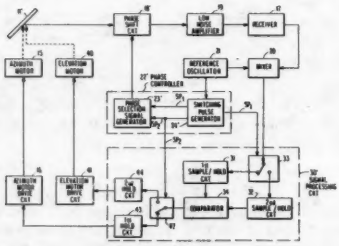
Toshinobu Yamane; Akio Kuramoto; Ryuji Shimizu, and Makoto Nakayama, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,215

Claims priority, application Japan, May 29, 1987, 62-133808; Sep. 16, 1987, 62-229606; Apr. 30, 1988, 63-105516

Int. Cl.[4] G01S *13/00*; H01Q *3/22*

U.S. Cl. 342—155 **12 Claims**



1. In a tracking system for tracking an electromagnetic energy source which comprises an antenna for receiving the electromagnetic energy, receiver means coupled with the antenna through feeding means for producing a signal of the electromagnetic energy received by the antenna as a receive signal, and moving means for mechanically and angularly moving the antenna so as to point the antenna to the electromagnetic energy source to thereby maximize the receive signal strength, the improvement which comprises:

said antenna being a radiator having an antenna beam which is changeable in direction in response to variation of an electric characteristic in said feeding means;

selection signal generating means for producing a first and a second selection signal alternately;

said feeding means comprising electric variable means which is variable in impedance as the electric characteristic from one to another of a first and a second value, said antenna beam being directed in a first direction when said electric variable means has said first value, said antenna beam being directed in a second direction when said electric variable means has said second value, said first and said second directions having a predetermined small angular difference, said electric variable means having said first and said second values alternately in response to said first and said second selection signals alternately produced to thereby switch said antenna beam from one to the other of said first and said second directions;

detection means coupled with said receiver means for detecting said received signal to produce a detected signal;

processing means coupled with said detection means for deciding the detected signal strength before and after switching of said antenna beam to produce an error signal; and

said moving means coupled with said processing means and responsive to said error signal for mechanically and angularly moving said antenna to thereby reduce said error signal.

4,881,079

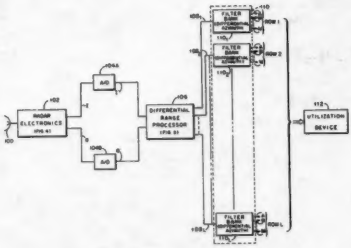
APERTURE RADAR

Theodore J. Peregrim, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 28, 1987, Ser. No. 138,280

Int. Cl.[4] G01S *7/44, 13/89*

U.S. Cl. 342—194 **4 Claims**



1. A radar apparatus mounted on an aircraft comprising:

(a) means for transmitting radar pulses towards an illuminated area;

(b) means for receiving radar pulses reflected from a first plurality of reflecting points in the illuminated area;

(c) means, responsive to the means for receiving radar pulses, for forming a second plurality of signals characterizing the illuminated area based on the difference in ranges between the aircraft and each of the first plurality of reflecting points taken in pairs; and

(d) means, responsive to the second plurality of signals, for producing a third plurality of signals characterizing the illuminated area based on the difference in ranges between the aircraft and each of the first plurality of reflecting points taken in pairs and the difference in azimuthal angle between the aircraft and each of the first plurality of reflecting points taken in pairs.

4,881,080

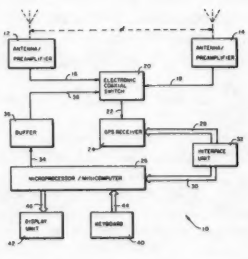
APPARATUS FOR AND A METHOD OF DETERMINING COMPASS HEADINGS

Daniel G. Jablonski, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1985, Ser. No. 748,248

Int. Cl.[4] G01S *5/02*; H04B *7/185*

U.S. Cl. 342—357 **9 Claims**



1. An improved method of determining compass headings of a platform (ship or aircraft) in association with the NAVSTAR/GPS multi-satellite system, said improved method comprising the steps of:

positioning first and second antenna/preamplifiers fore and

aft on paid platform a predetermined distance d apart in line with the heading of said platform;

receiving position derivable data from said NAVSTAR/GPS multisatellite system via said first and second antenna/preamplifiers;

reading the position fix of said first antenna/preamplifier from a GPS receiver into a microprocessor/minicomputer;

switching said GPS receiver to said second antenna/preamplifier;

reading the position fix of said second antenna/preamplifier from said GPS receiver into said microprocessor/minicomputer; and

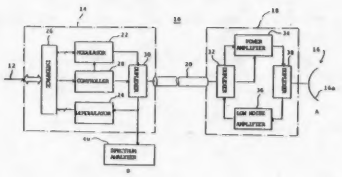
computing an equivalent compass heading in said microprocessor/minicomputer according to a predetermined equation based on the position fixes of said first and second antenna/preamplifiers as determined by said GPS receiver and the predetermined distance d therebetween.

4,881,081

ANTENNA ORIENTATION ADJUSTING DEVICE FOR EARTH STATION

Masashi Yoshihara, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 97,661, Sep. 15, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,291
Claims priority, application Japan, Sep. 17, 1986, 61-218855
Int. Cl.[4] H01Q *3/00*
U.S. Cl. 342—359 **6 Claims**



1. A device comprising means for permitting a person in the vicinity of a common transmission-and-reception antenna to manually adjust the orientation of a reflecting surface of the antenna, where said antenna is included within an earth station that further includes indoor and outdoor units connected together solely by a solitary signal link used for both transmission and reception; said outdoor unit being located in the vicinity of said antenna; and said indoor unit having a demodulator for demodulating a signal that is received by said antenna and routed to said indoor unit through said solitary signal link and for applying automatic gain control to the received signal; said device further comprising;

a converting means for converting an automatic gain controlled voltage signal output by said demodulator into a first signal;

a control means for converting the first signal into a predetermined control signal and feeding the predetermined control signal to said outdoor unit through said solitary signal link;

a display means electrically connected to the outdoor unit for viewing by the mentioned person and being responsive to the control signal for displaying a level which corresponds to the automatic gain controlled voltage; and

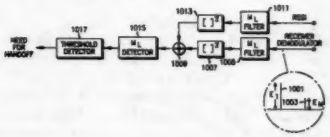
disable means for preventing power from being radiated through said antenna when said control and display means are operating.

4,881,082

ANTENNA BEAM BOUNDARY DETECTOR FOR PRELIMINARY HANDOFF DETERMINATION

Victor Graziano, Oak Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1988, Ser. No. 163,591
Int. Cl.[4] G01S *5/04*
U.S. Cl. 342—432 **36 Claims**



15. A cellular radiotelephone system antenna beam boundary handoff detector for sectorized cells, comprising:

at least one directional antenna receiving a first radio signal from a first geographic area of radio coverage defined by a beam boundary;

a broad beam antenna receiving a second radio signal from a second geographic area of radio coverage including at least part of said first geographic area, said second radio signal having a high correlation to said first radio signal at said first and second antennas;

means for comparing a magnitude of said first radio signal with a magnitude of said second radio signal; and

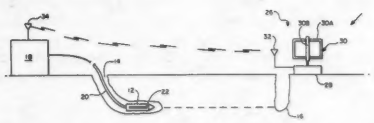
means, responsive to said means for comparing, for generating an output signal when said second radio signal magnitude exceeds a predetermined proportion of said first radio signal magnitude thereby determining said beam boundary.

4,881,083

HOMING TECHNIQUE FOR AN IN-GROUND BORING DEVICE

Albert W. Chau, Redmond, and John E. Mercer, Kent, both of Wash., assignors to FlowMole Corporation, Kent, Wash.

Filed Oct. 2, 1986, Ser. No. 914,706
Int. Cl.[4] E21B *44/00, 47/022*
U.S. Cl. 342—459 **17 Claims**



1. A homing system including an in-ground boring device for directing said device through the ground from its particular location at a given point to a specific in-ground target point, said system comprising:

(a) first means including a transmitting antenna carried by said boring device for producing a near full electromagnetic dipole field which functions as a predetermined homing signal;

(b) second means including a receiving antenna arrangement and cooperating circuitry located at a ground level point for detecting said homing signal and for producing its own internal signal containing information which indicates whether the horizontal component of movement of the boring device is on or off a course leading to said target point and, if the boring device is off said course, whether its horizontal component of movement is headed to the left or right of some course which will bring the boring device to the target point;

(c) third means including a second transmitting antenna and cooperating circuitry also located at said ground level

point and responsive to said internal signal for producing a control signal containing said information and transmitting said control signal by electromagnetic waves to a remote location; and

(d) control means located in part at said remote location and in part on said boring device and at least in part responsive to said control signal for steering said device on a course to said target point.

4,881,084

IMAGE RECORDING METHOD USING FLUID INK ELECTROCHEMICALLY IMPARTED WITH ADHESIVENESS

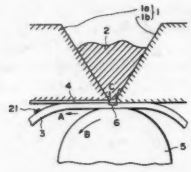
Fumitaka Kan, Tokyo; Yasuyuki Tamura; Naoki Kushida, both of Yokohama; Koichi Tohma; Hiroshi Fukumoto, both of Kawasaki; Toshiya Yuasa, Mitaka; Noboru Tohyama, Tokyo, and Norihiko Koizumi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 75,045

Claims priority, application Japan, Jul. 25, 1986, 61-175191; Sep. 13, 1986, 61-216752; Jan. 9, 1987, 62-1709; Apr. 23, 1987, 62-98590; May 29, 1987, 62-131584

Int. Cl.[4] G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—1.1 **15 Claims**



1. A recording method comprising:

providing an ink which is fluid at room temperature and is substantially non-adhesive but can be imparted with an adhesiveness by a change in the crosslinked structure of the ink through an electrochemical reaction on application of an energy;

causing the fluid ink to contact a transfer-receiving medium at an ink contact position; and

applying a pattern of the energy corresponding to a given image signal to the fluid ink at or in the neighborhood of the ink contact position to selectively provide the ink with an adhesive pattern by said electrochemical reaction, which is then transferred to the transfer-receiving medium to form an ink pattern corresponding to the energy pattern applied.

4,881,085

VACUUM POWERED MANUALLY OPERATED CLEANING TOOL FOR ACTIVE SURFACES OF FLUID-JET PRINT HEAD

Jeffrey W. Gibson, Pleasant Garden, N.C., and Hal Bayman, Richardson, Tex., assignors to Burlington Industries, Inc., Greensboro, N.C.

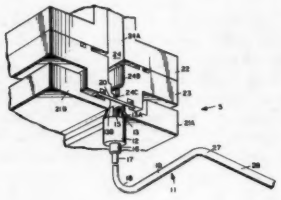
Filed Aug. 18, 1987, Ser. No. 86,486

Int. Cl.[4] G01D *15/18;* **A47L** *9/00*

U.S. Cl. 346—75 **29 Claims**

1. A manually operated cleaning tool for use in a liquid jet printing apparatus of the type having a manifold assembly including an interior fluid cavity, means for generating a linear array of droplet streams under pressure through an orifice plate in fluid communication with said interior cavity, and mounting means for mounting said orifice plate to said manifold assembly, said cleaning tool comprising:

vacuum head means for contacting the active surfaces of said orifice plate and said mounting means, said vacuum head means comprising an elongated head having a fluid passageway formed therein for receiving an transporting excess printing fluid, connector means for operably connecting said vacuum head means to said adjusting means and said fluid conduit, and a pair of vacuum lips for contacting said active surfaces of said orifice plate and said mounting means, wherein said vacuum lips have a generally frusto-conical configuration and are disposed in parallel confronting relationship to define a laterally extending opening therethrough;



adjusting means for rotatably and angularly positioning said vacuum head means to contact said active surfaces;

a fluid conduit operatively connected to said vacuum head means; and

vacuum means for continuously removing excess printing fluid from said active surfaces of said orifice plate and said mounting means through said fluid conduit.

4,881,086

LASER RECORDER WITH SHEET EDGE DETECTION

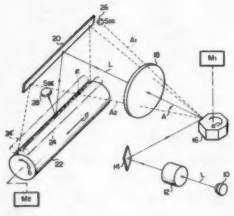
Naoya Misawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1988, Ser. No. 236,989

Claims priority, application Japan, Aug. 31, 1987, 62-218285; Dec. 25, 1987, 62-331055

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—108 **30 Claims**



13. A laser-beam image recording apparatus for recording images on a light-sensitive sheet medium through irradiation of an information-carrying laser beam, comprising

(a) laser beam generating means for emitting a laser beam,

(b) deflecting means for directing said laser beam toward a linear zone and deflecting the laser beam to swing repeatedly along the linear zone,

(c) means for transporting a light-sensitive sheet medium to pass through said linear zone,

(d) detecting means for detecting an arrival o the leading edge of the sheet medium at said linear zone, and

(e) beam modulating means for modulating the laser beam to be generated by said laser beam generating means, said beam modulating means being operative to modulate the laser beam depending on the image to be recorded on a leading portion of a light-sensitive sheet medium before said detecting means detects that the leading edge of the light-sensitive sheet medium which has been advancing toward said linear zone reaches the linear zone and to

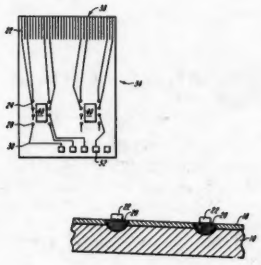
modulate the laser beam depending on the images to be recorded on a portion subsequent to said leading portion of the light-sensitive sheet medium after said detecting means detects that the leading edge of the light-sensitive sheet medium advanced toward said linear zone has reached the linear zone.

4,881,087

PRINTHEAD STRUCTURE AND METHOD OF FABRICATION

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Mar. 2, 1988, Ser. No. 163,365
Int. Cl.[4] G01D *15/16, 15/10*; H05B *1/00*
U.S. Cl. 346—139 C **15 Claims**



1. A printhead of a type having a writing plane on a side edge of the printhead, comprising:

a conductive sheet having a surface terminating at an edge, which edge defines the writing plane of the printhead;

a dielectric substance coating said surface of the conductive sheet and extending to said edge;

at least one dielectric-filled indentation in the dielectric coating and the conductive sheet and disposed along said edge of the conductive sheet; and

an array of spaced electrodes disposed on said dielectric coating on said surface, each electrode beginning at said edge over the dielectric-filled indentation and extending to a conductive pad on said coating on said surface.

4,881,088

PLOTTER PEN INK LEVEL DETECTOR

Paul C. Fisher, Jr., 785 Marita Dr., Boulder City, Nev. 89005; Wiebe H. Van Der Meer, Van Zijldreef 47, Postbus 64, 3980 CB Bunnik, Netherlands, and Paul C. Fisher, 711 Yucca St., Boulder City, Nev. 89005

Filed Aug. 26, 1988, Ser. No. 240,056
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **14 Claims**

1. A writing apparatus comprising:

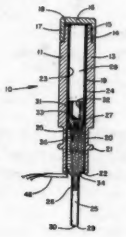
a) a hollow elongated cartridge, **23**

b) writing means located at an end portion of the cartridge, **30**

c) a column of writing fluid contained in the cartridge adjacent to the writing means, **26**

d) ink-following object means contained in the cartridge and supported by the writing fluid, **27**

e) magnet means carried by the ink-following object means; and **36**



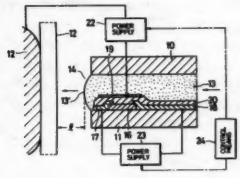
f) means for sensing the location of the magnet means whereby the level of the column of writing fluid can be determined. **46**

4,881,089

THERMAL-ELECTROSTATIC INK JET RECORDING APPARATUS

Koichi Saito; Yoshihiko Fujimura, and Nanao Inoue, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,332
Claims priority, application Japan, Mar. 27, 1986, 61-67304
Int. Cl.[4] E01D *15/16*
U.S. Cl. 346—140 R **4 Claims**



1. An image recording apparatus adapted to apply both electric and thermal energy to a liquid coloring agent to jet droplets of the liquid coloring agent toward a backing electrode adapated to support a recording medium, said apparatus comprising:

container means for containing said liquid coloring agent, said container means comprising a pair of spaced apart, opposing wall members, each of said wall members including an inner surface and at least one edge, said container including a discharge portion at one of said edges of said wall members for discharging said liquid coloring agent from said container means;

a thermal energy applying means for selectively locally heating the liquid coloring agent, said thermal energy applying means comprising a plurality of heating elements arranged on the inner surface of a first one of said wall members and lead electrodes adapted to supply current to said heating elements;

a heat resistant insulating layer being provided over said heating elements;

electric energy applying means for applying an electric field to said liquid coloring agent, said electric energy applying means further comprising an electric field forming electrode positioned on the heat resistant insulating layer;

a first power supply for establishing a voltage drop between the electric field forming electrode and the backing electrode to produce the electric field, said electric field hav-

ing a level less than the level required to jet liquid coloring agent toward the backing electrode; and

second power supply means for selectively energizing said heating elements to raise the temperature of the liquid coloring agent in the area of said energized heating elements to jet droplets of said liquid coloring agent under the influence of said electric field.

4,881,090

METHOD AND APPARATUS FOR IDENTIFYING NEGATIVES IN PHOTOGRAPHIC LABORATORIES

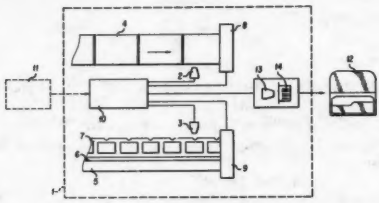
Roberto Signoretto, Venice, Italy, assignor to Photo Engineering S.R.L., Venice, Italy

Filed Sep. 13, 1988, Ser. No. 243,631

Claims priority, application Italy, Sep. 25, 1987, 84159 A/87

Int. Cl.[4] G03B *17/24*

U.S. Cl. 354—105 **17 Claims**



1. A method of correlating negatives and order envelopes in a finishing station of a photographic laboratory, comprising steps of

passing a continuous web of negatives into said finishing station,

affixing a continuous web along one edge of said web,

cutting said web into strips, each strip remaining attached to a corresponding length of said tab,

marking order identification data on said tab in synchronization with the cutting step, and

inserting each of said strips pertaining to a particular order into an envelope for that order.

4,881,091

DATA CARD ILLUMINATION ARRANGEMENT

Donald G. Josephson, Wilmington, Mass., assignor to Polaroid Corporation, Cambridge, Calif.

Filed Mar. 6, 1989, Ser. No. 318,959

Int. Cl.[4] G03B *15/03*

U.S. Cl. 354—132 **13 Claims**

1. A data card illumination arrangement for use in a compact portable identification card camera system, comprising: means for defining a data card illumination compartment; a data card support structure for supporting a data card holder in

position for a data card frame supported thereby to be exposed,

said support structure being located within said illumination compartment; means for defining an opening in a wall of said illumination compartment

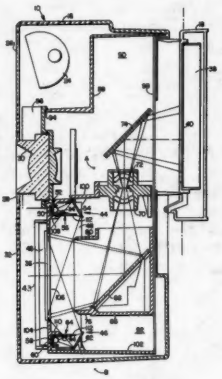
to permit loading of the data card holder into said

support structure; first and second linear sources of illumination mounted on opposite ends

of said support structure;

reflector means mounted adjacent each of said first and second linear sources of illumination for reflecting light therefrom back toward said support structure; and filter means extending along the length of each of said first and second

linear sources of illumination for providing uniform dispersion of



illumination reflected by said reflector means over the data frame.

4,881,092

MOTOR DRIVEN CAMERA

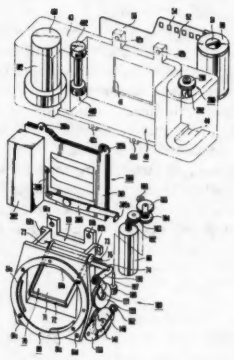
Hidehiko Fukahori; Masayuki Suzuki, and Yoshihiko Aihara, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 139,844

Claims priority, application Japan, Jan. 7, 1987, 62-002172; Jan. 7, 1987, 62-002177; Jan. 7, 1987, 62-002178

Int. Cl.[4] G03B *1/12, 19/12*

U.S. Cl. 354—152 **9 Claims**



1. A motor driven camera comprising:

a mirror drive mechanism for swinging a mirror to an exposure retracted position from a finger viewing position and to the finder viewing position from the exposure retracted position;

a shutter charge mechanism for performing charge driving and charge releasing of a shutter;

a first film drive mechanism for driving film in a direction reverse to a feeding direction for each successive shot;

a first motor serving as a drive source for driving said mirror drive mechanism, said shutter charge mechanism and said first film drive mechanism, wherein said mirror drive mechanism, for said mirror drive mechanism effects mir-

ro: movement from the finder viewing position to the exposure retracted positions and back to the finder viewing positions with unidirectional rotation of said first motor; and

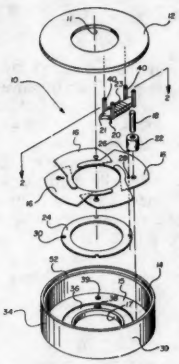
a clutch mechanism having output transmission systems being changed over in response to a change of the direction of rotation of an output of said first motor, one of said output transmission systems being connected to said mirror drive mechanism and said shutter charge mechanism, and another of said output transmission systems being connected to said first film drive mechanism.

4,881,093

ELECTROMAGNETIC SHUTTER APPARATUS

David R. Dowe, Holley, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1988, Ser. No. 185,196
Int. Cl.[4] G03B *9/10*
U.S. Cl. 354—234.1 **8 Claims**



1. A shutter apparatus comprising:

a. support means having an opening;

b. a plurality of shutter blades which are attached to the support means for movement about a main axis between a first position in which the blades cover a greater amount of the opening, and a second position in which the blades cover a lesser amount of the opening;

c. a plurality of permanent magnets which are respectively attached to the blades in a manner that the mass of the magnets are generally centered about the main axis;

d. a plurality of means, attached to the support means, for generating an electromagnetic field which interacts with the permanent magnets so as to cause movement of the magnets in a manner that the blades move between their first positions and their second positions; and

e. means for synchronizing the shutter blades and the means for generating an electromagnetic field in a manner to maintain equal rates of movement of the blades.

4,881,094

LENS INTERCHANGE TYPE SINGLE-LENS REFLEX CAMERA SYSTEM AND INTERMEDIATE BARREL THEREFOR

Nobuhiko Terui, Ichikawa; Yosuke Kusaka, Yokohama; Yoshiharu Shiokama, and Nobuaki Sasagaki, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

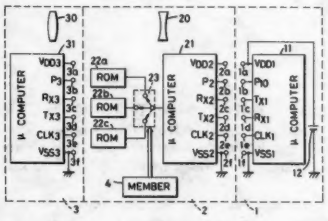
Filed Feb. 10, 1988, Ser. No. 154,585
Claims priority, application Japan, Feb. 16, 1987, 62-32635
Int. Cl.[4] G03B *17/14*
U.S. Cl. 354—286 **12 Claims**

12. An intermediate barrel mountable between a camera body and each of a plurality of interchangeable lenses, comprising:

(a) memory means in which data are fixedly stored;

(b) selector means for selecting a part of said data; and

(c) output means for outputting the selected part of said data to said camera body, said data indicating a plurality of



combined aberration information with respect to combined optical systems which consist of an optical system of said intermediate barrel and respective optical systems of said plurality of interchangeable lenses;

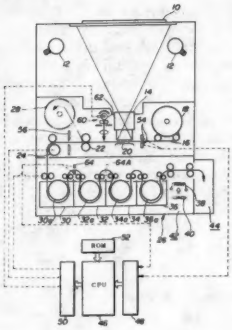
(d) said camera body effecting a calculation process on the basis of said selected part of said data.

4,881,095

PROCESS FOR DEVELOPING PHOTOGRAPHED FILM AND FOR PRINTING IMAGES THROUGH DEVELOPED FILM

Shinichi Shidara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1988, Ser. No. 243,348
Claims priority, application Japan, Sep. 11, 1987, 62-226664; Sep. 11, 1987, 62-226665; Sep. 11, 1987, 62-226667
Int. Cl.[4] G03D *3/13, 5/04;* G03B *27/80*
U.S. Cl. 354—298 **22 Claims**



1. A process for developing a film having one or more photographed image areas, comprising the steps of:

(a) exposing a region of said film other than said photographed image areas with a constant quantity of light;

(b) passing the region exposed with said constant quantity of light to a developing station preceding to said photographed image areas to develop said region exposed with said constant quantity of light;

(c) detecting the density of the developed image of said region exposed with said constant quantity of light, comparing the thus detected image density with a characteristic curve showing the change in density of the developed image in terms of the quantity of exposure light, and

setting the condition for development to an optimum condition based on said characteristic curve; and

(d) developing said photographed image areas under said optimum condition.

4,881,096

MOTOR-DRIVEN SHUTTER FOR CAMERA

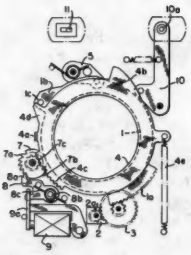
Masuo Ogihara; Hiroyuki Ishida; Shinji Nagaoka; Youichi Seki; Shigeru Tagami; Hiroshi Yamazaki, and Nobuo Shinozaki, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,169

Claims priority, application Japan, Feb. 28, 1986, 61-43230

Int. Cl.[4] G03B *3/10, 7/00, 9/22*

U.S. Cl. 354—400 **17 Claims**



1. A shutter device for use in a camera, comprising:

motor means;

a drive member drivable by said motor means;

range adjustment means normally urged by a resilient member for movement with said drive member;

focus detecting means operable in coaction with said range adjustment means for producing a focusing signal;

solenoid means de-energized in response to the focusing signal from said focus detecting means for placing said range adjustment means in a focused position;

said range adjustment means including a locking member lockable by said solenoid means in a standby position, and a retracting member for unlocking said locking member to allow said solenoid means to place said range adjustment means in the focused position when the shutter device starts to operate.

4,881,097

APPARATUS FOR CONTROLLING AUTOMATIC FOCUSING IN CAMERAS

Yasuaki Ishiguro, Fujimi, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,334

Claims priority, application Japan, Mar. 13, 1987, 62-58059

Int. Cl.[4] G03B *1/00, 3/10, 19/12*

U.S. Cl. 354—402 **5 Claims**

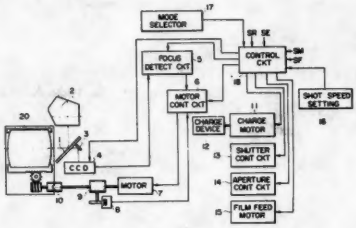
1. A camera system, comprising:

a phototaking lens forming a phototaking optical path;

a moving mirror arranged in said phototaking optical path;

mirror operating means actuatable to retract said moving mirror from said phototaking optical path for the purpose of exposing a film;

focal point detecting means for determining an amount of movement of said phototaking lens with respect to an object to be photographed on the basis of light from the object via said moving mirror in the phototaking optical path;



lens moving means for moving said phototaking lens according to the determined amount of movement of said lens; and

control means for controlling said mirror operating means and said lens moving means, the control means controlling timing of the start of the actuation of said mirror operating means so that substantially on the completion of the retraction of said moving mirror from said phototaking optical path, said lens moving means completes movement of said phototaking lens.

4,881,098

Patent Not Issued For This Number

4,881,099

READER PRINTER AND IMAGE RECORDING APPARATUS

Kazuhiko Onuki, Tokyo, and Masami Maetani, Ageo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,245

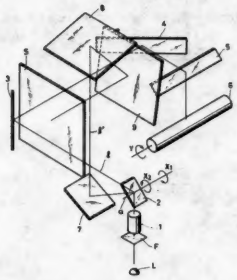
Claims priority, application Japan, Jul. 31, 1987, 62-190430; Dec. 28, 1987, 62-329664

Int. Cl.[4] G03B *13/28*

U.S. Cl. 355—45 **13 Claims**

1. An image recording apparatus comprising:

a projection lens;
first reflection means rotatably disposed for reflecting light rays transmitted through said projection lens;
second reflection means for transmitting light rays reflected from said first reflection means onto an image display section; and
third reflection means for transmitting light rays reflected from said first reflection means onto an image recording

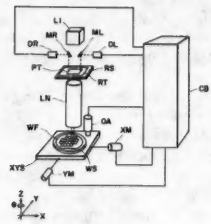


section, said third reflection means including a plurality of mirrors, arranged to reflect light from said first reflection means successively from mirror to mirror and then to said image recording section, said plurality of mirrors being further arranged such that the optical axes of light rays reflected to each of said mirrors are located in substantially the same plane.

4,881,100
ALIGNMENT METHOD

Akiya Nakai, Tokyo; Bunei Hamasaki, Yokohama, and Shinji Utamura, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 201,260, May 25, 1988, abandoned, which is a continuation of Ser. No. 938,279, Dec. 5, 1986, abandoned. This application Nov. 16, 1988, Ser. No. 273,187
Claims priority, application Japan, Dec. 10, 1985, 60-275923; Dec. 10, 1985, 60-275924
Int. Cl.[4] G03B *27/42*; G01B *11/00*
U.S. Cl. 355—53 **9 Claims**

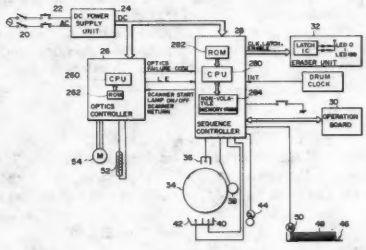


1. An aligment method, usable with a workpiece having different portions, for positioning one by one the different portions of the workpiece with respect to a predetermined reference, said method comprising the steps of:
attempting detection of devation between at least one of the different portions of the workpiece and the predetermined reference;
discriminating whether the attempted detection has been achieved;
detecting deviation between another portion of the workpiece, which is in the neighborhood of said at least one portion of the workpiece, and the predetermined reference when the achievement of the attempted detection is not discriminated; and
positioning one by one the different portions of the workpiece with respect to the predetermined reference in accordance with the detection of the deviation of the workpiece with respect to said at least one portion when the achievement of the attempted detection is discriminated, and in accordance with the detection of the deviation of the workpiece with respect to said other portion when the achievement of the detection is not discriminated.

4,881,101
DEVICE FOR SETTING OPERATION MODES OF OFFICE EQUIPMENT

Hiroyasu Sumida, Ichikawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 269,059
Claims priority, application Japan, Nov. 10, 1987, 62-283873
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—204 **8 Claims**



1. A device for setting operation modes of a machine having a machine body, a housing surrounding said machine body, and an openable cover member forming part of said housing, and driven by a power supply unit, said device comprising:
power supply shut-off means for shutting off at least a part of power supplies of said power source unit when said cover member is opened;
store means for preserving data stored in said store means even when said power supply of said machine is shut off by said power supply shut-off means;
commanding means for commanding preservation of operation modes of said machine; and
control means for controliing said power supply unit, said store means and said commanding means;
said control means causing said store means to store operation modes of said machine when said machine is being powered by said power supply unit;
said control means initializing, when a command from said commanding means is absent, the operation modes of said machine after said machine has been powered by said power supply unit;
said control means restoring, when the command from said commanding means is present, said machine to the operation modes stored in said store means after said machine has been powered by said power supply unit.

4,881,102

COPIER WITH VARIABLE MAGNIFICATION RATIO

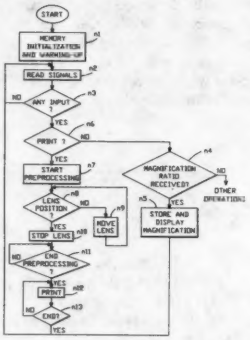
Masaru Nishijima, and Akihiro Soga, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1988, Ser. No. 252,680

Claims priority, application Japan, Oct. 21, 1987, 62-266714

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—243 **3 Claims**



1. A copier capable of varying magnification ratio comprising

input means for receiving a magnification ratio,

lens moving means for moving an optical system of said copier according to said received magnification ratio, and

control means for driving said lens moving means only after a print switch is operated to start a copying operation of said copier to move said optical system to a position determined by said received magnification ratio.

4,881,103

DEVELOPING APPARATUS

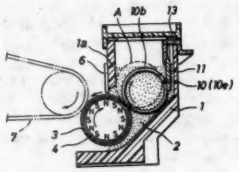
Yutaka Seto; Shigehiro Suzuki; Tomohiro Suzuki, all of Hachioji; Atsushi Fujita; Akira Tai, both of Kobe, and Masahiro Yoshino, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,867

Claims priority, application Japan, Oct. 31, 1986, 61-261442; Oct. 31, 1986, 61-168266[U]; Jun. 12, 1987, 62-146770

Int. Cl.[4] G03G *15/09*; B05C *11/00*

U.S. Cl. 355—251 **19 Claims**



1. A developing apparatus comprising:

a developing vessel for containing a developing agent;

a developing sleeve having an external surface, said developing sleeve being rotatable about an axis of rotation and being disposed relative to said developing vessel so that a

a desired portion of said developing sleeve is disposed within said developing vessel;

a photosensitive body disposed adjacent said developing sleeve for developing an electrostatic latent image formed on said photosensitive body;

a permanent magnet disposed inside said developing sleeve for establishing a magnetic field to form a brush of developing agent adjacent said external surface of said developing sleeve, said developing sleeve being rotated while said brush is kept in contact with said photosensitive body;

an agitating member disposed in said developing vessel having at least two ring portions for providing frictional engagement with said external surface of said developing sleeve, so that said agitating member rotates as said developing sleeve rotates; and

an agitating portion joining said at least two ring portions, said agitating portion being for agitating developing agent in said developing vessel.

4,881,104

IMAGE FORMING APPARATUS HAVING A PLURALITY OF FEED OPENINGS

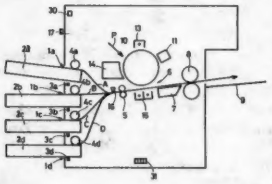
Keiji Kusumoto, and Kenzo Nagata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 184,621

Claims priority, application Japan, Apr. 24, 1987, 62-102876; Apr. 24, 1987, 62-102877; Apr. 24, 1987, 62-102878; Apr. 24, 1987, 62-102879; Apr. 24, 1987, 62-102880; Apr. 24, 1987, 62-102881

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—309 **52 Claims**



1. An image forming apparatus comprising:

a plurality of paper feed means for feeding sheets of paper,

image forming means for forming an image on the sheet fed by said paper feed means,

counting means for counting the number of erroneous feeding operations occurring in each of said plurality of paper feed means,

first selection means for manually selecting any one of said plurality of paper feed means,

forbidding means for forbidding said first selection means to select the paper feed means in which the number of erroneous feeding operations counted by said counting means exceeds a predetermined number,

designation means for designating the paper feed means in which the number of erroneous feeding operations is the smallest out of the paper feed means the selection of which is not forbidden by said forbidding means, each time said forbidding means is operated,

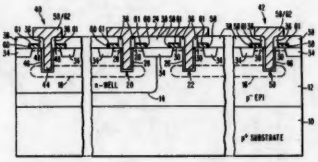
initialization signal generating means, and

second selection means for selecting the paper feed means designated by said designation means, in response to the initialization signal from said initialization signal generating means.

4,881,105
INTEGRATED TRENCH-TRANSISTOR STRUCTURE AND FABRICATION PROCESS

Bijan Davari, Mahopac; Wei Hwang, Armonk, and Nicky C. Lu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1988, Ser. No. 206,148
Int. Cl.[4] H01L 27/08, 29/78
U.S. Cl. 357—23.4 11 Claims



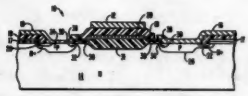
1. An integrated, self-aligned trench-transistor structure comprising:
- a substrate of semiconductor material,
- a layer of epitaxial material,
- a well region disposed in said epitaxial layer,
- a first source element region disposed in said well region,
- a second source element region disposed in said epitaxial layer proximate to said well region,
- a first trench disposed in said epitaxial layer and into said first source element in said well region, said first trench being filled with conductive material to form a first gate element region,
- a second trench disposed in said epitaxial layer and into said second source element region, said second trench being filled with conductive material to form a second gate element region,
- a first drain element region disposed in the surface of said epitaxial layer around said first filled trench,
- a second drain element region disposed in the surface of said epitaxial layer around said second filled trench,
- said first filled trench gate element region, said first source element region and said first drain element region forming a first conductivity type vertical transistor,
- said second filled trench gate element region, said second source element region and said second drain element region forming a second conductivity type vertical transistor,
- a region of conductive material connecting said conductive gate material in said first trench and said conductive gate material in said second trench,
- a third trench disposed in said epitaxial layer and into said first source element region in said well region proximate to said first trench, said third trench being filled with conductive material to form a third gate element region, and
- a third drain element region disposed in the surface of said epitaxial layer around said third trench,
- said third trench gate element region, said first source element region and said third drain element region forming a first conductivity type vertical trench strapping transistor for providing bias signal to said first source element region.

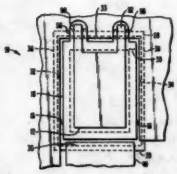
4,881,106
DV/DT OF POWER MOSFETS

Mark B. Barron, Danville, Calif., assignor to IXYS Corporation, San Jose, Calif.

Filed May 23, 1988, Ser. No. 197,540
Int. Cl.[4] H01L 29/78, 29/44
U.S. Cl. 357—23.8 5 Claims

1. A power MOSFET structure comprising:
- a volume of semiconductor material doped to a first conductivity type; and
- at least one MOSFET cell;
- said MOSFET cell being formed in said semiconductor material, said MOSFET cell comprising:
- a well region of semiconductor material doped to a second conductivity type opposite to said first conductivity type and having a source region and a gate region, said source region being formed of said first conductivity type,
- a source metallization layer in electrical contact with substantially all of said source region,



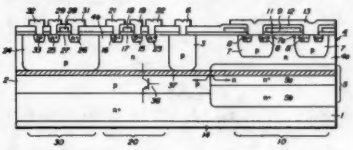


- a gate metallization layer,
- a gate pad area under said gate metallization layer confronting said gate region, and
- a polysilicon material layer juxtaposed between said gate metallization layer and said gate region and forming only a strip perimeter region in said gate pad area, said polysilicon material layer separating said pad area from said volume, said polysilicon material layer being in electrical contact with said source metallization layer and electrically insulated from said gate metallization layer in order to tie the potential of said strip perimeter region to the potential of said source metallization layer.

4,881,107
IC DEVICE HAVING A VERTICAL MOSFET AND AN AUXILIARY COMPONENT

Tsutomu Matsushita, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jun. 29, 1988, Ser. No. 213,073
Claims priority, application Japan, Jul. 3, 1987, 62-165487; Aug. 13, 1987, 62-200996
Int. Cl.[4] H01L 27/00
U.S. Cl. 357—23.4 17 Claims



1. A semiconductor device comprising:
- an underlying layer formed in a semiconductor substrate body, said underlying layer including a first layer of a first conductivity type;
- an overlying layer of said first conductivity type located over said underlying layer in said substrate body;
- an isolation layer of a second conductivity type located between said overlying layer and said first layer;

an isolation region of said second conductivity type extending into said overlying layer from an upper surface of said overlying layer and contacting said isolation layer, said isolation region separating first and second portions of said overlying layer from each other, said second portion being separated from said underlying layer by said isolation layer;

a channel region of said second conductivity type located in said first portion of said overlying layer to form a vertical MOSFET;

an auxiliary region formed in said second portion of said overlying layer to form an auxiliary integrated circuit component;

a recombination layer capable of promoting recombination of carriers, said recombination layer being located under said second portion of said overlying layer and;

a highly doped buried layer of said first conductivity type located between said first portion of said overlying layer and said underlying layer;

wherein said recombination layer extends between said second portion of said overlying layer and said isolation layer, and further extends into said buried layer.

4,881,108

SEMICONDUCTOR DEVICE

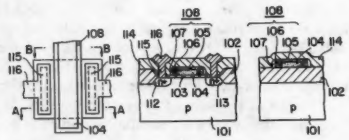
Kuniyoshi Yoshikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1988, Ser. No. 172,495

Claims priority, application Japan, Mar. 26, 1987, 62-72174

Int. Cl.[4] H01L *29/78, 29/34*

U.S. Cl. 357—23.5 **3 Claims**



1. A semiconductor device comprising:

first and second regions separately provided from each other on a surface region of a semiconductor substrate, said first and second regions serving as source and drain regions, respectively,

a charge accumulation region, and

a gate provided on a channel region between said first and second regions,

said charge accumulation region disposed on said channel region on a side surface of said gate and not on a top surface of said gate, said charge accumulation region including a silicon nitride interposed between said gate and said first or second region.

4,881,109

SENSOR USING A FIELD EFFECT TRANSISTOR AND METHOD OF FABRICATING THE SAME

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 26, 1986, Ser. No. 900,629

Claims priority, application Japan, Aug. 29, 1985, 60-190772; Aug. 29, 1985, 60-190776

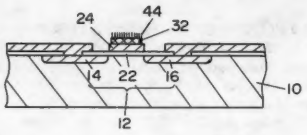
Int. Cl.[4] H01L *29/66, 29/96*

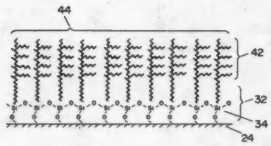
U.S. Cl. 357—25 **10 Claims**

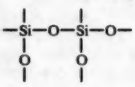
1. A sensor comprising:

a field effect transistor having a gate electrode;

a polymerized monomolecular film with







bonds formed selectively on the surface of said electrode; and

a monomolecular film of sensing material fixed on said gate electrode through said polymerized monomolecular film by a chemical bond between said sensing material and said polymerized monomolecular film in such a manner that said sensing material is kept active.

4,881,110

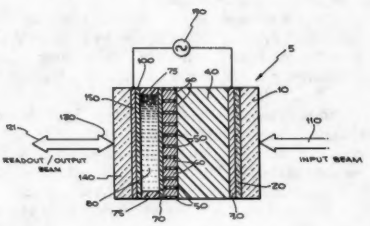
DOUBLE-SCHOTTKY DIODE LIQUID CRYSTAL LIGHT VALVE

Paul O. Braatz, Canoga Park, and Uzi Efron, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 758,917, Jul. 25, 1985, Pat. No. 4,842,376. This application May 16, 1988, Ser. No. 194,352

Int. Cl.[4] G02F *1/135;* **H01L** *29/48, 27/14*

U.S. Cl. 357—30 **6 Claims**



1. A photosubstrate for use in light valve devices comprising:

semiconductor substrate means for absorbing an incident beam of radiation, said absorption producing photogenerated carriers;

first and second Schottky diode means, alternately reverse-biased, disposed on opposing sides of said substrate means for maintaining said substrate substantially depleted of

said carriers, at least one of said Schottky diode means having a plurality of metal islands in a matrix pattern, wherein said second Schottky diode means comprises a plurality of metal islands with insulating channels therebetween oriented to reflect a readout beam of radiation whereby diodes are formed by the interface of asid metal islands and said substrate means.

4,881,111

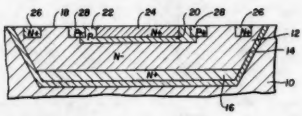
RADIATION HARD, HIGH EMITTER-BASE BREAKDOWN BIPOLAR TRANSISTOR

Thomas J. Sanders, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 771,602, Feb. 24, 1977, abandoned. This application Dec. 27, 1978, Ser. No. 973,822

Int. Cl.[4] H01L *29/72*

U.S. Cl. 357—34 **20 Claims**



1. A vertical bipolar transistor comprising:

means for operating as an emitter including an emitter region of first conductivity type having a first surface and a low impurity concentration;

means for operating as a base including a base region of an opposed second conductivity type in said emitter region at said surface;

means for operating as a collector including a collector region of said first conductivity type in said base region at said surface and extending along a substantial portion of the base surface;

a ring of said second conductivity type in said emitter and base regions at their junction, speed from the collector region, extending down from said surface at least the depth of said collector region and having a substantially greater impurity concentration than said base region; and

an emitter contact of said first conductivity type in said emitter region at said surface adjacent to said first ring having a substantially greater impurity concentration than said emitter region and spaced from said first ring a sufficient distance to provide an emitter to base breakdown voltage of greater than thirty volts.

4,881,112

IC WITH RECOMBINATION LAYER AND GUARD RING SEPARATING VDMOS AND CMOS OR THE LIKE

Tsutomu Matsushita, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 20, 1988, Ser. No. 196,714

Claims priority, application Japan, May 29, 1987, 62-133962

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—47 **18 Claims**

1. A semiconductor device comprising:

a highly doped lower layer of a first conductivity type, formed in a substrate body,

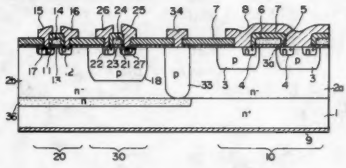
a lightly doped upper layer of said first conductivity type, formed above said highly doped lower layer within said body,

a vertical MOSFET formed in a first portion of said lightly doped upper layer so that said lightly doped layer is used as a substantial drain region of said vertical MOSFET,

a second circuit component formed in a second portion of said lightly doped upper layer,

a guard ring formed in said lightly doped upper layer so as to separate said first and second portions, and

a recombination layer for facilitating recombination of minority carriers, said recombination layer being formed between said highly doped lower layer and at least said



second portion of said lightly doped upper layer, said guard ring reaching said recombination layer.

4,881,113

SEMICONDUCTOR INTEGRATED CIRCUITS WITH A PROTECTION DEVICE

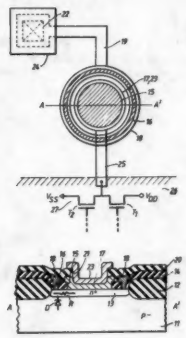
Masaki Momodomi; Mitsugi Ogura, both of Yokohama, and Takaki Kumanomido, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 29, 1986, Ser. No. 924,444

Claims priority, application Japan, Oct. 31, 1985, 60-242655

Int. Cl.[4] H01L *27/02, 29/78, 23/48, 29/46*

U.S. Cl. 357—51 **27 Claims**



1. A semiconductor integrated circuit device, comprising:

a semiconductor substrate having a circuit region thereon;

a pad means formed on said semiconductor substrate;

a first semiconductor region of one conductivity type, formed at the surface of said semiconductor substrate and forming a PN junction with said semiconductor substrate;

first and second electrodes, each contacting said first semiconductor region, the contacting regions of said electrodes facing each other with a ring-shaped region between;

first connection means for connecting said pad means to said first electrode; and

second connection means for connecting said second electrode to said circuit region.

4,881,114
SELECTIVELY FORMABLE VERTICAL DIODE CIRCUIT ELEMENT

Amr M. Mohsen, Saratoga; Esmat Z. Hamdy, Fremont, and John L. McCollum, Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

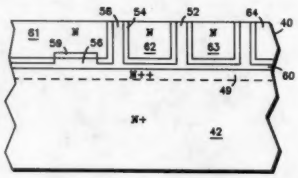
Filed May 16, 1986, Ser. No. 864,038
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[4] H01L *29/48, 29/91, 29/04, 27/10*
U.S. Cl. 357—54 9 Claims

1. A selectively formable vertical diode circuit element formed by a process including the steps of:
   - forming a diffusion area of a first conductivity type in a semiconductor substrate of a second conductivity type,
   - forming a first oxide insulating layer over said diffusion area,
   - forming a second silicon nitride insulating layer over said first insulating layer,
   - forming a third oxide insulating layer over said second insulating layer,
   - forming a semiconductor layer of second conductivity type over said insulating layer above at least a portion of said diffusion area,
   - and further a step of applying a voltage source for a controlled time between selected ones of a said diffusion areas and said semiconductor layer, at a voltage sufficient to break down said first, second, and third insulating layers and form a diode.

4,881,115
BIPOLAR SEMICONDUCTOR DEVICE HAVING A CONDUCTIVE RECOMBINATION LAYER

Israel A. Lesk, and Lowell E. Clark, both of Phoenix, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 138,262, Dec. 28, 1987, Pat. No. 4,837,177.
This application Feb. 21, 1989, Ser. No. 312,268
Int. Cl.[4] H01L *29/167*
U.S. Cl. 357—64 13 Claims

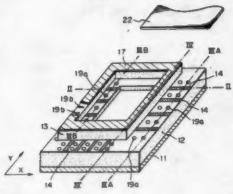


1. A semiconductor device having a conductive recombination layer comprising:
   - a collector, said collector comprising:
     - a first doped semiconductor substrate including a first surface and a second surface;
     - a second doped semiconductor substrate having a greater dopant concentration than said first semiconductor substrate and including a first surface and a second surface; and
     - a conductive recombination layer comprised of a doped polycrystalline material and disposed between said first and second substrates and further being contiguous to said first and second substrates at their first surfaces.

4,881,116
PACKAGE FOR INTEGRATED CIRCUIT

Norio Hidada, Kanagawa, and Yasutake Hirachi, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 56,709, Jun. 2, 1987, abandoned. This application May 2, 1989, Ser. No. 346,243
Claims priority, application Japan, Jun. 2, 1986, 61-127739; May 25, 1987, 62-125733
Int. Cl.[4] H01L *23/30, 23/14, 23/48*
U.S. Cl. 357—74 24 Claims

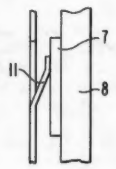


1. A package for an integrated circuit having conductor lines which can be connected to an external circuit to connect the integrated circuit to the external circuit, comprising:
   - a dielectric plate having a first end face with a grounding conductor thereon and a second end face opposite the first end face, with the conductor lines thereon, said dielectric plate having conductor poles which are located between the conductor lines and which extend through the thickness of said dielectric plate to said grounding conductor, at least two of said conductor poles positioned intermittently between adjacent ones of the conductor lines, said at least two of said conductor poles defining a line which extends in substantially the same direction as said conductor lines.

4,881,117
SEMICONDUCTOR POWER DEVICE FORMED OF A MULTIPLICITY OF IDENTICAL PARALLEL-CONNECTED ELEMENTS

Luciano Gandolfi, Corsico, and Giuseppe Ferla, Catania, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Milan, Italy

Filed Feb. 23, 1984, Ser. No. 582,793
Claims priority, application Italy, Feb. 28, 1983, 19832 A/83
Int. Cl.[4] H01L *23/02, 23/12*
U.S. Cl. 357—74 4 Claims



1. A three-terminal semiconductor device formed of a plurality of active elements interconnected in parallel, in which each of said plurality of active elements are respectively formed in respective semiconductor chips and have three contact areas which constitute electrical terminals of said active element, the first of said three contact areas being located on one surface of said chip and the second and third of said contact areas being located on another surface of said chip, said device comprising:

a metal supporting plate to which are attached said plurality of active elements arranged in a predetermined configuration, said first contact areas of each of said active elements being in ohmic contact with said plate so as to thereby connect all of said first contact areas together;

a first metal electrode and a second metal electrode which are respectively in electrical contact with said second and third contact areas of each of said active elements so as to thereby connect all of said second contact areas together and all of said third contact areas together, said supporting plate and first and second electrodes thereby connecting said active elements in parallel;

a housing for hermetically sealing all of said device except for a portion of said metal plate and portions of said first and second electrodes, said portions forming said three terminals of said device;

wherein said first and second metal electrodes are arranged adjacent to said active elements and each of electrodes have lugs which are respectively located in the area of said second and third contacts of said active elements, such that at least some of said lugs are electrically connected, by an ohmic contact, to said second and third contact areas; and

wherein said first and second electrodes each have a metal sheet structure in the form of a comb with a plurality of teeth which are positioned so as to be insulated from each other and in the same plane and wherein said plurality of teeth of said first electrode are arranged between said plurality of teeth of said second electrode, and wherein said lugs of said first and second electrodes are formed by flanged portions of said metal sheet.

4,881,118

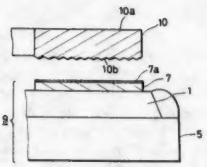
SEMICONDUCTOR DEVICE

Kazuhiko Niwayama; Tsutomu Nakagawa; Futoshi Tokunoh, and Shigekazu Yoshida, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 156,567, Feb. 17, 1988, abandoned. This application Apr. 28, 1989, Ser. No. 346,277

Int. Cl.[4] H01L *23/10, 23/04, 21/603*

U.S. Cl. 357—79 **12 Claims**



1. A semiconductor device comprising:

a semiconductor having a cathode electrode layer formed of aluminum on one surface thereof and an anode electrode layer formed on another surface thereof;

an anode conductor arranged to contact with the surface of said anode electrode layer;

a cathode sliding compensator made of a material having a thermal coefficient substantially similar to that of a semiconductor and having one surface being finished as an irregular surface and another surface being finished as a sliding surface, said irregular surface being arranged to contact with the surface of said cathode electrode layer;

a cathode conductor made from a material having a thermal coefficient different than that of a semiconductor and arranged to contact with said sliding surface of said cathode sliding compensator; and

means for holding said cathode conductor and said anode conductor so as to pressurize respective junction surfaces between said cathode conductor, said cathode sliding compensator, said semiconductor element and said anode conductor such that the irregular surface of said compensator penetrates any oxide formed on said aluminum cathode electrode layer.

4,881,119

SEMICONDUCTOR DEVICES

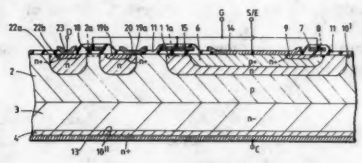
David H. Paxman, Redhill; John A. G. Slatter, Crawley Down, and David J. Coe, East Grinstead, all of England, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 46,972, May 5, 1987, abandoned. This application Feb. 2, 1989, Ser. No. 306,243

Claims priority, application United Kingdom, May 16, 1986, 8612010

Int. Cl.[4] H01L *27/06*

U.S. Cl. 357—23.4 **10 Claims**



1. A semiconductor device comprising a bipolar transistor having an emitter region of one conductivity type, a base region of the opposite conductivity type in contact with said emitter region, and a collector region of the one conductivity type in contact with said base region, a first insulated gate field effect transistor, having a channel region for providing a switchable connection to the emitter region of the bipolar transistor, and a second insulated gate field effect transistor having a source region of said opposite conductivity type and a channel region for providing a charge extraction path from the base region when the bipolar transistor is turned off, the first insulated gate field effect transistor comprising a source region, a further region of the opposite conductivity type provided in the emitter region for separating said source region and said emitter region, and an insulated gate which overlies said channel region of the first transistor, said channel region comprising at least part of the further region between the emitter region and the source region of the first insulated gate field effect transistor to provide the switchable connection, and the second insulated gate field effect transistor comprising an insulated gate overlying said channel region of the second insulated gate field effect transistor, which includes at least part of the emitter region adjacent the base region to provide a switchable connection between the base region and the source region of the second insulated gate field effect transistor to provide the charge extraction path from the base region via the second insulated gate field effect when the bipolar transistor is turned off.

4,881,120

CONDUCTIVE MODULATED MOSFET

Akio Nakagawa, Hiratsuka; Hiromichi Ohashi, Yokohama; Yoshihiro Yamaguchi, Urawa; Kiminori Watanabe, Kawasaki, and Thuneo Thukakoshi, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 19,337, Feb. 26, 1987, Pat. No. 4,782,372, which is a continuation of Ser. No. 738,188, May 28, 1985, Pat. No. 4,672,407. This application Nov. 4, 1987, Ser. No. 116,357

Claims priority, application Japan, May 30, 1984, 59-110244; Sep. 29, 1984, 59-204427; Nov. 20, 1984, 59-244811

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.4 **13 Claims**

1. A conductivity modulated metal oxide semiconductor field effect transistor, comprising:

a first conductivity type region having a first surface;

a high resistance semiconductor region of a second conductivity type having a second surface;

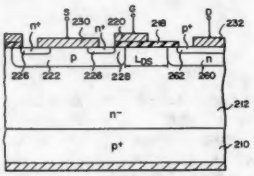
a second conductivity type region provided between said first conductivity type region and said high resistance semiconductor region and having an impurity concentration higher than that of said high resistance semiconductor region;

a base region of the first conductivity type which is formed in the second surface of said high resistance semiconductor region;

a source region of the second conductivity type which is formed in said base region;

a gate electrode formed at least on a gate insulating film which is formed on a channel region formed in said base region between said high resistance semiconductor region and said source region;

a source electrode ohmic-contacting said source and base regions; and



a drain electrode formed on said first surface of the first conductivity type region;

wherein when a total channel width within a unit area (1 cm^2) of an active region is W(μm), an area of said high resistance semiconductor region which is formed beneath said gate electrode and is in direct contact with the gate insulating film within said unit area of the active region is SG(μm^2), a perimeter of said base region in contact with the high resistance semiconductor region, i.e., the perimeter of SG, within the 1 cm^2 unit area of the active region, in μm, is T(μm), a channel length is l(μm) and a thickness of said gate insulating film is d(μm), a condition $(W \cdot SG)/(T \cdot l \cdot d) < 1.46 \times 10^8$ is satisfied; and

wherein said active region is defined as a region including the base and source regions contacting the source electrode and the high resistance semiconductor region under the gate electrode.

4,881,121

COLOR VIDEO SIGNAL PHASE DETECTOR

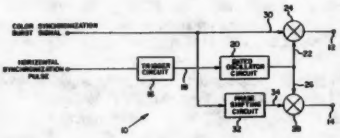
John L. Judge, Hillsboro, Oreg., assignor to Magni Systems, Inc., Beaverton, Oreg.

Continuation of Ser. No. 17,314, Feb. 20, 1987, Pat. No. 4,792,845. This application Dec. 16, 1988, Ser. No. 285,859

The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.

Int. Cl.[4] H04N *17/02*

U.S. Cl. 358—10 **22 Claims**



10. An electrical circuit for measuring the phase characteristics of a color video signal representing plural video image scan lines and including for each of them a color synchronization burst signal and a horizontal synchronization pulse, comprising:

triggering means receiving the horizontal synchronization pulse of one of the scan lines for providing a trigger signal in response to a transition between amplitude levels of the horizontal synchronization pulse of the one scan line;

oscillator means for providing in response to the trigger signal a continuous-wave reference signal having a phase characteristic that is defined relative to the horizontal synchronization pulse of the one scan line and is independent of the horizontal synchronization pulses of other scan lines; and

first mixing means for mixing the continuous-wave reference signal with the color synchronization burst signal of the one scan line, thereby to provide a first output signal corresponding to the phase angle between the color synchronization burst signal and the horizontal synchronization pulse.

4,881,122

THREE-DIMENSIONAL SHOOTING VIDEO CAMERA APPARATUS

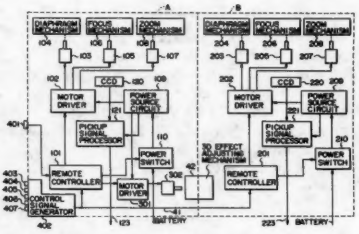
Kanji Murakami, 7-1-12-102, Minamiaoyama, Minato-ku, Tokyo, Japan

Filed Nov. 29, 1988, Ser. No. 277,565

Claims priority, application Japan, Mar. 29, 1988, 63-75350

Int. Cl.[4] H04N *13/02*

U.S. Cl. 358—88 **3 Claims**



1. A 3D shooting video camera apparatus comprising:

first and second video camera main bodies each having a condition setting device built therein for setting shooting conditions including at least one of diaphragm, focus and zoom, of a lens section and each having a controller built therein for controlling said shooting conditions in accordance with a control signal;

coupling means for coupling said first and second video camera main bodies to each other so as to face a shooting point in a horizontal plane, for supporting, at one end, a front portion of said first video, camera main body to make said first video camera main body horizontally rotatable and for supporting, at another end, a front portion of said second video camera main body to make said video camera main body horizontally rotatable;

3D effect adjusting means for performing adjustment, in a shooting direction, of a cross point of optical axes of said lens sections of said first and second video camera main bodies which cross each other in front of said first and second video camera main bodies, said 3D effect adjusting means having one end coupled to a rear portion of said first video camera main body and another end coupled to a rear portion of said second video camera main body, whereby an interval between said rear portions of said first and second video camera main bodies can be adjusted by adjusting positions of where said 3D effect adjusting means is coupled to said first and second video camera main bodies; and

shooting conditions setting means for setting said shooting

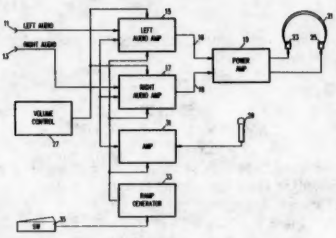
conditions for said first video camera main body the same as said shooting conditions for said second video camera main body, said shooting condition setting means including means for guiding data input to said controller of said first video camera main body to an input section of said controller of said second video camera main body.

4,881,123

VOICE OVERRIDE AND AMPLITUDE CONTROL CIRCUIT

James H. Chapple, 415 Tyler Pl., Apt. L, Salinas, Calif. 93906

Filed Mar. 7, 1988, Ser. No. 164,886
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—104 **15 Claims**



1. In an audio system, electronic circuitry for overriding a normal audio signal with a voice signal, said electronic circuitry comprising:

at least one audio channel having at least one stage of amplification, said amplification stage having a first input for inputting said normal audio signal and a second input for inputting said voice signal, said amplification stage including bias means for setting the relative input levels of said normal audio signal and said voice signal;

amplifier means having an output, said output coupled to said second input, for amplifying said voice signal and coupling said voice signal to said second input, said amplifier means including means responsive to a control signal for controlling the amplitude of said voice signal; and

control means coupled to said amplification stage and to said amplifier means and to said first and second inputs of said amplification stage for providing said control signal, said control signal applied to a bias input of said amplification stage, said bias means responsive to said control signal for linearly decreasing the level of said normal audio signal input to said amplification stage to a predetermined level of said normal audio signal and for linearly increasing the level of said voice signal input to said amplification stage from a minimum to a maximum level, said control means including adjusting means to adjust said predetermined level of said normal audio signal.

4,881,124

X-RAY TELEVISION APPARATUS

Hisatake Yokouchi, Tokyo; Fumitaka Takahashi, and Masayuki Tsuneoka, both of Kashiwa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Continuation of Ser. No. 828,518, Feb. 12, 1986, abandoned.
This application Jul. 18, 1988, Ser. No. 220,978
Claims priority, application Japan, Feb. 25, 1985, 60-34395
Int. Cl.[4] H05G *1/64*
U.S. Cl. 358—111 **9 Claims**

4. An X-ray television apparatus comprising:

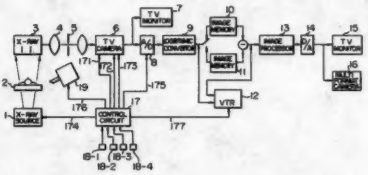
image intensifier means for intensifying an X-ray image of an object obtained by irradiation of an X-ray beam to the object and converting said X-ray image to a visible image;

television camera means for enabling production of said visible image using a photoconduction type image pickup tube, said image pickup tube including an electron beam which is scanned horizontally and vertically to provide a plurality of scanning lines;

A/D converter means for A/D converting an image signal from said television camera means;

image processing means for storing said image signal and processing said image signal on the basis of data stored in said image processing means;

mode selecting switch means for selecting one mode from a plurality of operating modes including a first operating mode having a predetermined number of pixels for an image and a predetermined number of scanning lines for said television camera means, and a second operating mode having a number of pixels $1/n^2$ times as large as that



of said first operating mode and a number of scanning lines $1/n$ times as large as that of said first operating mode, n being an integer;

control means for controlling the horizontal synchronizing frequency and the vertical synchronizing frequency for scanning said television camera means in accordance with an output of said mode selecting switch means such that the vertical synchronizing frequency in said second operating mode becomes n^2 times as large as that in said first operating mode and that the horizontal synchronizing frequency in said second operating mode becomes n times as large as that in said first operating mode so that a converting period of said A/D converter means becomes constant through said first and second operation mode.

4,881,125

PROGRESSIVE SCAN DISPLAY OF VIDEO DERIVED FROM FILM

Edward A. Krause, San Diego, Calif., assignor to General Instrument Corporation, New York, N.Y.

Filed Oct. 14, 1988, Ser. No. 258,238
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—141 **2 Claims**

2. A system for providing a progressive-scan video display signal from a received video signal derived from a film having successive image frames by producing odd and even video fields from each film frame, with the video fields being produced at a greater rate than the film frame rate and in a repetitive sequentially varying relationship to the film frames, the system comprising

means for delaying each field of the received video signal;

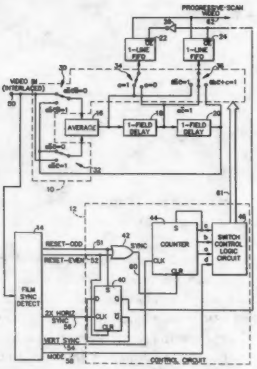
means for combining the received and delayed video fields to provide a progressive-scan video frame signal at the video field rate, in which alternate lines are derived respectively from odd and even video fields;

means for determining the positions of the received video fields in the repetitive sequence; and

means coupled to the determining means for controlling the combining means in accordance with said determined field positions to vary said combinations in accordance with the repetitive sequentially varying relationship of the received video fields to the film frames from which they were derived;

wherein in accordance with the repetitive sequentially varying relationship of the received video fields to the film frames from which they were derived, ten video fields are

derived from every four film frames with the first video field being an odd field derived from the first film frame, the second video field being an even field derived from the first film frame, the third video field being an odd field derived from an average of the first and second film frames, the fourth video field being an even field derived from the second film frame, the fifth video field being an odd field derived from the second film frame, the sixth video field being an even field derived from the third film frame, the seventh video field being an odd field derived from the third film frame, the eighth video field being an even field derived from an average of the third and fourth film frames, the ninth video field being an odd field derived from the fourth film frame, and the tenth video field



being an even field derived from the fourth film frame; and

wherein the controlling means cause the combining means to provide a progressive scan video frame signal by progressively interlacing the first and second video fields with each other to provide sequentially first, second and third identical video frames, by progressively interlacing the fourth and fifth video fields with each other to provide sequentially fourth and fifth identical video frames, by progressively interlacing the sixth and seventh video fields with each other to provide sequentially sixth, seventh and eighth identical video frames, and by progressively interlacing the ninth and tenth video fields with each other to provide sequentially ninth and tenth identical video frames.

4,881,126

IMAGE COMPOSING APPARATUS

Mitsuaki Uesugi; Masaichi Inomata, and Isamu Komine, all of Kanagawa, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,604

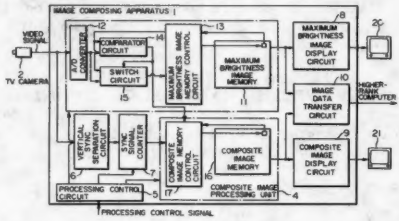
Claims priority, application Japan, Mar. 31, 1988, 63-76392

Int. Cl.[4] H04N *5/14*

U.S. Cl. 358—160 **7 Claims**

1. An image composing apparatus comprising:

Image composing means whereby external input signals are inputted and simultaneously a video signal inputted from a television camera is processed from moment to moment for a predetermined period of time to form a composite image in which a value of each of picture elements is represented by a value of corresponding one of said external input signals at an instant that a level of said video



signal becomes highest or lowest during said predetermined period of time.

4,881,127

STILL VIDEO CAMERA WITH ELECTRONIC SHUTTER AND FLASH

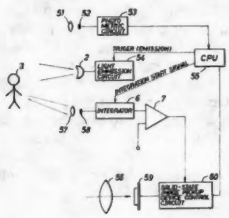
Seiichi Isoguchi; Yoshio Murai; Jun Takayama, and Katsuya Nagaishi, all of Hachioji, Japan, assignors to Konica Corporation, Shinjuku, Japan

Filed Feb. 24, 1988, Ser. No. 159,933

Claims priority, application Japan, Feb. 25, 1987, 62-44028; Mar. 6, 1987, 62-51488; Mar. 6, 1987, 62-51489; Apr. 20, 1987, 62-97914; Apr. 24, 1987, 62-101533; May 13, 1987, 62-117639; May 13, 1987, 62-117638; May 13, 1987, 62-117637

Int. Cl.[4] H04N *5/238, 5/14*

U.S. Cl. 358—213.19 **3 Claims**



1. A still video camera for generating a still video image of an object, comprising:

photosensor means including odd and even rows of photosensors for generating an electrical charge in response to light incident thereon;

vertical transfer means for simultaneously accepting the electrical charge from both said odd and even rows of photosensors;

a charge extraction drain for extracting the charge on said photosensor means to initialize said photosensor means prior to exposing said photosensor means;

an electronic flash for illuminating the object to be photographed with electronic flash light;

electronic flash light receiving means for receiving electronic flash light reflected from the object and generating a signal in response thereto;

integrating means for integrating the signal from the electronic flash light receiving means and generating an integration signal in response thereto;

electronic shutter means for starting an exposure time after the charge extraction drain extracts the charge from said photosensor means, starting the emission of electronic flash light from said electronic flash after a predetermined period of time has elapsed from the start of the exposure

time, and enabling the transfer of the electrical charge on said photosensor means to said vertical transfer means when said integration signal reaches a predetermined value.

4,881,128

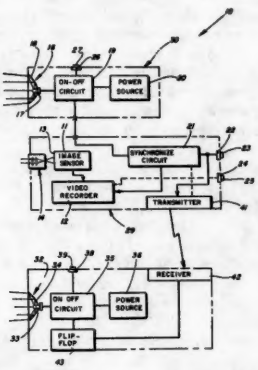
VIDEO CAMERA AND RECORDER SYSTEM WITH ILLUMINATION CONTROL FEATURES

Masahiro Yamada, North White Plains, N.Y., assignor to Asahi Research Corporation, North White Plains, N.Y.

Filed May 11, 1988, Ser. No. 192,849

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—228 19 Claims



1. A video movie camera system for operation for prolonged periods of time of indefinite length under operator control, comprising: means including image sensor means for developing a video signal corresponding to images developed in an image region, lens means for projecting images from a view region to said image region, recording means coupled to said image sensor means for recording said video signal, electrically energizable light source means for illuminating said image region, an electrical power source, light source control means for controlling energization of said light source means from said electrical power source, and synchronizing means for controlling both said light source control means and said recording means for operating only during desired time intervals to effect energization of said light source means and illumination of said view region and to substantially simultaneously effect concurrent operation of said recording means, said energization means and said illumination means for recording of the video signal developed from the image of the view region illuminated by said light source means over prolonged periods of time and under the control of the operator, said synchronizing means including a switching means operable between two stable conditions on and off and said switching means being operated from said off condition to said on condition at the beginning of each period of time selected by an operator and from said on condition to said off condition at the end of each period of time selected by an operator.

4,881,129

FACSIMILE INTERFACE DEVICE FOR LAND-MOBILE TELEPHONES

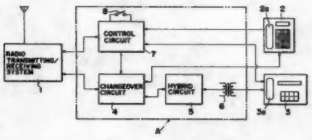
Yasuhiro Mitsuhashi, Yokohama, Japan, assignor to Keihin Co., Ltd., Yokohama, Japan

Filed Sep. 2, 1988, Ser. No. 239,743

Claims priority, application Japan, Mar. 31, 1988, 63-43990[U]

Int. Cl.[4] H04B *1/46*

U.S. Cl. 358—434 12 Claims



1. An interface device for connection to a radio transmitter/-receiver, a telephone set, and a facsimile device, said interface device comprising:

a mode select means for selecting an operational mode of said interface device;

a changeover means for selectively connecting one of the telephone set and the facsimile device to the radio transmitter/receiver in accordance with a changeover signal supplied thereto;

a matching means connected to said changeover means for electrically matching the radio transmitter/receiver with the facsimile device;

a control means connected to said changeover means for determining based on said operational mode whether a signal received from said radio transmitter/receiver is to be transmitted to said telephone set or said facsimile device, and for outputting said changeover signal to said changeover means in accordance with the determination as to whether a signal received from said radio transmitter/receiver is to be transmitted to said telephone set or said facsimile device, and for setting said facsimile device into an automatic receiving mode.

4,881,130

IMAGE EDITING SYSTEM FOR AN IMAGE RECORDING APPARATUS WITH THE CAPABILITY OF MARKING AN EDITED IMAGE AREA IN THE FORM OF A VECTOR

Tadao Hayashi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 281,027

Claims priority, application Japan, Dec. 7, 1987, 62-307744; Dec. 8, 1987, 62-308681; Dec. 8, 1987, 62-308683; Oct. 17, 1988, 63-259445

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—443 3 Claims

1. An image editing system for an image recording apparatus, comprising:

marking means for marking a particular image area being edited by said recording apparatus in the form of a vector;

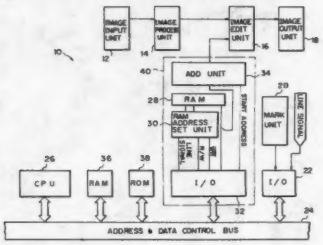
outputting means for outputting a difference between area data which are determined on a line basis by an inclination of the vector;

memory means for storing the differences;

address setting means for feeding addresses to said memory means;

setting means for setting a start point of the vector; and

means for adding the differences stored in said memory means to the start point of the vector to produce data of



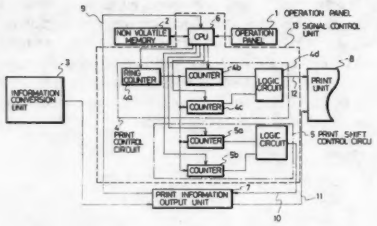
the particular area associated with a main scanning direction.

4,881,131

PLOTTER ADJUSTMENT CIRCUIT

Hiroshi Morita, Tokyo, Japan, assignor to Seiko Instruments Inc., Chiba, Japan

Filed Jun. 27, 1988, Ser. No. 212,302
Claims priority, application Japan, Jun. 25, 1987, 62-158573
Int. Cl.[4] H04N *1/21, 1/00;* G01D *9/42, 15/06*
U.S. Cl. 358—296 **5 Claims**



1. A plotter for plotting data in a selected print region, comprising:

A. a conversion means for converting input plot data into raster data;

B. shift circuit means connected to said conversion means for receiving raster data from said conversion means, said shift circuit means comprising: print control means for generating and outputting a print enable signal, and output means for outputting raster data received from said conversion means at a time different from the time of outputting of the print enable signal, the time different being determined by a shift value;

C. a print means having a print head and connected to said shift circuit means for receiving the raster data outputted by said output means and the print enable signal outputted by said print control means, and for plotting figures represented by the plot data in response to receipt of the print enable signal;

D. input means connected to said shift circuit means for supplying the shift value thereto; and

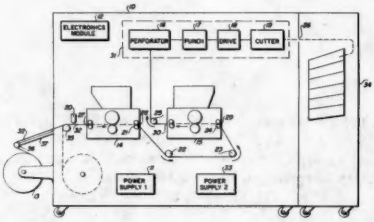
E. memory means connected to said input means for storing the shift value.

4,881,132

APPARATUS AND METHOD FOR COORDINATING THE FRONT AND BACK OF A PRINTER APPARATUS HAVING TWO-SIDED PRINTING CAPABILITY

Jaroslav Lajos, Edmond, Okla., assignor to Honeywell Bull Inc., Phoenix, Ariz.

Filed May 4, 1988, Ser. No. 190,209
Int. Cl.[4] H04N *1/23;* G01D *15/06*
U.S. Cl. 358—296 **4 Claims**



1. A printer system for printing he front and back sides of paper processed therethrough, said printer system comprising:

(A) first and second print engines placed in a path through which paper to be printed travels, said first and second print engines each having a paper input, a paper output and a print station situated intermediate said paper input and said paper output, said respective print stations of said first and second print engines being displaced an operative distance L from one another;

(B) a source of a continuous stream of paper;

(C) paper cutting means adapted to cut said continuous stream of paper into individual pages;

(D) guide means guiding said continuous stream of paper;

(1) from said source to said input of said first print engine;

(2) from said output of said first print engine to said input of said second print engine, said continuous stream of paper being inverted during its transit therebetween; and

(3) from said output of said second print engine to said paper cutting means;

(E) means for generating a first control signal indicating that a reference position along the length of said continuous stream of paper is under said print station of said first print engine, which said first control signal identifies the position of the top of a first page to be printed;

(F) means for generating a second control signal delayed in time from said first control signal equal to the time required for said reference position to transit said operative distance L;

(G) means for generating a third control signal delayed in time from said first control signal equal to the time required for said reference position to transit from beneath said print station of said first print engine to a position one page length beyond said paper cutting means;

(F) means responsive to the generation of said first control signal and to the passage of said reference position through said first print engine for causing said first print engine to print a first page of information on said continuous stream of paper;

(H) means responsive to the generation of said second control signal and to the passage of said reference position through said second print engine for causing said second print engine to print a second page of information on said continuous stream of paper on the reverse side thereof from the first page of information; and

(I) means responsive to the generation of said third control signal for severing said continuous stream of paper, the printer thereby issuing the first and second pages of information on the two sides of a discrete sheet of paper.

4,881,133
ARRANGEMENT FOR THE RECORDING OF AN INFORMATION SIGNAL

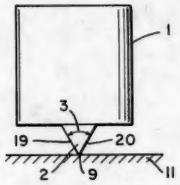
Horst Redlich, and Gunter Joschko, both of Berlin, Fed. Rep. of Germany, assignors to DMM Master Technik GmbH fur Informationstrager, Fed. Rep. of Germany

Filed Jul. 30, 1987, Ser. No. 79,421

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626021

Int. Cl.[4] H04N *1/23;* G01D *15/16*

U.S. Cl. 358—299 **2 Claims**



1. Apparatus for the recording of an information signal in which the information signal is engraved into the information carrier surface by a penetrating element to produce individual successive indentations comprising:

a plate-shaped, metallic recording carrier, having a recording plane and a velocity vector V_t during recording; and

a penetrating element having a pyramid shape with at least a first edge, a second edge and a third edge which converge at a tip to penetrate the surface of the recording carrier during engraving, said first edge being arranged such that its projection into the recording plane lies in the direction of the velocity vector V_t of the recording carrier, said first edge forming with the velocity vector V_t an angle α which satisfies the condition:

$$180° - \text{arc tangent} \frac{|V_a|}{|V_t|} > \alpha > 135°$$

where V_a is the velocity component of the tip perpendicular to the recording plane, and the projections of said second and third edges into the recording plane lie perpendicular to the direction of the velocity vector V_t, said penetrating element being fixed on an approximately circular positioning element wherein one generatrix of the approximately circular positioning element lies in the plane given by said second and third edges of said penetrating element and wherein said second and third edges can be easily polished without removal of said penetrating element from said positioning element.

4,881,134
COMB FILTER FOR THE REJECTION OF INTERTRACK CHROMONANCE CROSSTALK

Ulrich Grothaus, Puschendorf, and Klaus Lagerpusch, Nuremberg, both of Fed. Rep. of Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt, Max Grundig Holland, Stiftung & Co. KG, Furth, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,496

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710420

Int. Cl.[4] H04N *9/79*

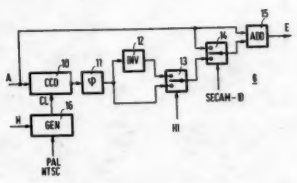
U.S. Cl. 358—328 **10 Claims**

1. A comb filter for rejecting intertrack chrominance cross talk during reproduction of a recorded color video signal recorded according to a recording standard, said color video signal having a signal standard and comprising a chrominance signal having a phase shift related to said signal standard and said recording standard, said comb filter comprising:

(a) a first signal path comprising a clocked CCD delay circuit for delaying said chrominance signal by a specific time interval thereby forming a delayed chrominance signal, and a first output coupled to said delay circuit for providing said delayed chrominance signal;

(b) a second signal path having a second output for providing said chrominance signal; and

(c) an adder stage coupled to said first and second outputs for adding said chrominance signal and said delayed chrominance signal;



characterized in that said first signal path comprises means for controlling the specific time interval of the delay provided to said chrominance signal in response to the period of the signal standard of said color signal and further comprises a phase correction circuit which eliminates said phase shift.

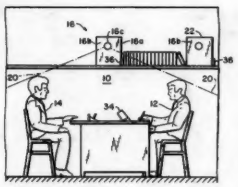
4,881,135
CONCEALED AUDIO-VIDEO APPARATUS FOR RECORDING CONFERENCES AND MEETINGS

Jordan B. Heilweil, Fox Rd., Florida, N.Y. 10921

Filed Sep. 23, 1988, Ser. No. 248,197

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—335 **16 Claims**



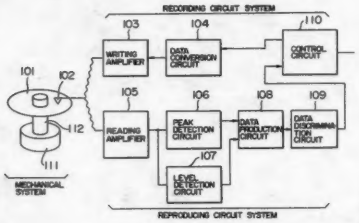
1. Concealed audio video apparatus, comprising video recording means for recording video imaged on a portion of said recording means; a microphone connected to said recording means, said imaging portion of said recording means and microphone being arranged proximate to an area within which a conference or meeting is to take place; power input means for energizing said video recording means; enclosure means for housing at least said imaging portion of said video recording means; remote control means for selectively remotely controlling the operation of said video recording means, said enclosure means permitting recording therethrough while concealing said video recording means housed therein; and positioning means for positioning said enclosure means to provide a desired imaging field of view of the conference or meeting area, whereby both the video and audio information reflecting the conference or meeting can be recorded by the selective control by one of the parties to the conference or meeting without the knowledge of the other(s) to thereby enable the candid audio and video recordation of the statements and actions taken by the attendees of the conference or meeting.

4,881,136

METHOD AND APPARATUS FOR DETECTING MINUTE DEFECTS ON MAGNETIC DISK BY MONITORING BOTH AMPLITUDE DECREASE AND PHASE SHIFT OF A REPRODUCED SIGNAL

Kazuhisa Shiraishi; Kazuo Nakagoshi, and Takuji Ogawa, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 927,960
Claims priority, application Japan, Nov. 8, 1985, 60-248809
Int. Cl.[4] G11B *5/455, 27/36;* G01R *33/12*
U.S. Cl. 360—25 **6 Claims**



1. A method for detecting defects on a recording medium, comprising the steps of:

recording onto the recording medium an amplitude signal corresponding to data to be written and coded in accordance with a 2-7 RLLC coding technique, the amplitude signal having a frequency which minimizes the peak value of the second derivative thereof within the frequency band of the amplitude signal;

reproducing the amplitude signal recorded on the recording medium;

detecting intervals of peak points of said reproduced amplitude signal;

detecting the peak-to-peak amplitude at each peak pint of said reproduced amplitude signal; and

determining a defect on the recording medium when said peak-to-peak amplitude is smaller than a predetermined value or the interval between said peak points of said amplitude signal is outside of a predetermined range.

4,881,137

MAGNETIC TAPE CASSETTE WITH TAPE PROTECTIVE CLOSURE AND LOCK MECHANISM

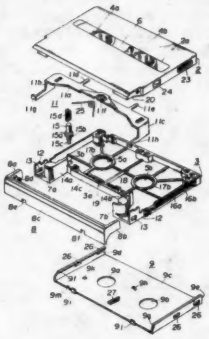
Hiroshi Meguro, Miyagi; Yoshinori Yamamoto, Kanagawa; Masao Ohyama, Tokyo; Kenichi Horikawa, Tokyo; Shigeru Mizusawa, Tokyo, and Kenji Kawakami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 867,940, May 29, 1986, abandoned, which is a division of Ser. No. 704,943, Feb. 25, 1985, abandoned. This application Sep. 1, 1988, Ser. No. 240,423
Claims priority, application Japan, Mar. 7, 1984, 59-43574
Int. Cl.[4] G11B *23/04, 15/32*
U.S. Cl. 360—96.5 **29 Claims**

1. A cassette holder in a recording and reproducing apparatus said cassette holder comprising:

a holder body defining therein a cassette reception space and having a floor on which said cassette is mounted; and

means, incorporated in said holder body and cooperatively associated with said locking means, for unlocking said locking means to allow movement of said shutter member from said first position to said second position when said magnetic tape cassette is inserted into said cassette reception space in a correct orientation, said unlocking means also serving to inhibit insertion of said magnetic tape



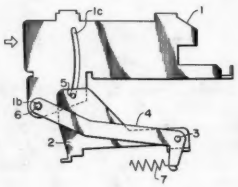
cassette into said cassette reception space of said cassette holder in an improper orientation.

4,881,138

CASSETTE LOADING APPARATUS

Masaki Uesugi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1987, Ser. No. 59,516
Claims priority, application Japan, Jun. 11, 1986, 61-133612
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.5 **1 Claim**



1. A cassette loading apparatus including:

a cassette receiving portion for receiving and holding a tape cassette in place;

a base plate fixed to a chassis;

said cassette receiving portion being collapsible toward said base plate so that said cassette receiving portion is movable from a cassette loading position to a loaded position;

said cassette receiving portion having at least a pair of opposite side walls, each of said side walls being provided with only one link which extends between and is pivotally connected to both said cassette receiving portion and said base plate;

a projection directly attached to said base plate, at each of the locations near the link pivotal supporting portion of said cassette receiving portion;

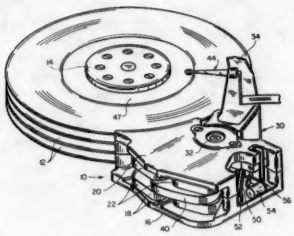
a generally vertical guide slot formed in said cassette receiving portion at each of said locations, the slots respectively receiving the projections therein to maintain the posture of said cassette receiving portion during the movement thereof; and

a spring adapted to bias said cassette receiving portion in a direction toward said loading position.

4,881,139
LATCH MECHANISM FOR ROTARY ACTUATOR AND THE LIKE

Henry B. Hazebrouck, Sunnyvale, Calif., assignor to Priam Corporation, San Jose, Calif.

Continuation of Ser. No. 694,708, Jan. 25, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 183,457
Int. Cl.[4] G11B 5/54, 21/16
U.S. Cl. 360—105 3 Claims



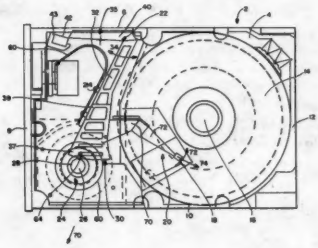
1. A rotary actuator for use in a disc drive comprising
a support structure for supporting a plurality of magnets in spaced relationship,
a plurality of actuator magnets mounted to said support structure for use in driving said rotary actuator,
a shaft supported by and rotatable in said support structure,
a pivot block assembly mounted to said shaft for rotation therewith, said pivot block assembly including a coil cooperatively arranged with said actuator magnets for driving said pivot block assembly, and
a bistable latch mechanism for selectively locking said pivot block assembly, said latch mechanism including an energizable electromagnet mounted to said support assembly and spaced from said actuator magnets, a ferrous latch arm for providing a low reluctance path for stray magnetic flux from said actuator magnets, means pivotally attaching said latch arm between said actuator magnets and said energizable electromagnet whereby said latch arm pivots towards said actuator magnets and engages said pivot block assembly in a first stable low reluctance path and said latch arm pivots towards said electromagnet and disengages said pivot block assembly in a second stable low reluctance path, said electromagnet being momentarily energized to effect flux through said latch arm and assuming either one polarity for pivoting said latch arm to said first stable low reluctance path or assuming an opposite polarity for pivoting said latch arm to said second stable low reluctance path, whereby upon deenergization of said electromagnet said pivot arm remains in the stable low reluctance path to which said pivot arm has been pivoted by the momentary energization of said electromagnet.

4,881,140
INTEGRATED DISC DRIVE AND ACTUATORS SUPPORT

Sanjoy Ghose, Santa Cruz; Efim Bronshvatch, Saratoga, and Miles L. Peterson, San Jose, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation-in-part of Ser. No. 914,690, Oct. 2, 1986, abandoned. This application Nov. 2, 1987, Ser. No. 115,691
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—106 9 Claims

1. A rotary actuator head positioning apparatus located within the housing of a disc drive comprising means for positioning a transducer relative to a recording medium comprising a constantly rotating disc within the housing, including
an arm releasably having a transducer affixed to one end of a head arm portion,
an elongate positioner arm being movable about a pivot point for positioning the transducer relative to the recording medium,
spring means supporting an end of said arm assembly at a pivot point,
first motor means mounted in the housing and having an output drive shaft coupled to a driven end of the arm assembly distal from said pivot point and the transducer

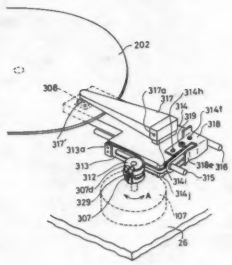


for positioning the arm assembly selectively over tracks on the disc,
second motor means mounted in said housing for supporting and constantly rotating said discs, whereby mounting both of said motors in said common base housing assures reliable relative positioning of said actuator and said discs, and
said head arm portion being attached to the side of said positioner arm and extending directly over said disc from a location between said pivot point and said first motor mount.

4,881,141
DRIVING APPARATUS FOR A MAGNETIC HEAD

Saburo Hasegawa, Hanamaki, and Eiji Minai, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 733,910, May 14, 1985. This application May 9, 1988, Ser. No. 191,968
Claims priority, application Japan, May 15, 1984, 59-96877; May 17, 1984, 59-99003; May 31, 1984, 59-111163; Jun. 12, 1984, 59-121164
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—106 5 Claims



1. A driving apparatus for a magnetic head comprising:
a capstan to be driven by a step motor;
a head carriage having a read-write head thereon and a recess part on a first face thereof and a second face;

a steel band which is connected to said head carriage along said first face and said second face of said head carriage and said band being operatively wound around said capstan at a side of said second face, to give linear motion to said head carriage in response to rotation of said capstan, the direction of said linear motion being substantially perpendicular to said first face; and

a strong spring for pressing one part of said steel band into said recess part.

4,881,142

MAGNETIC DISC UNIT EMPLOYING TEMPERATURE COMPENSATION

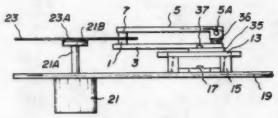
Masahiro Kato, Chichibu, and Yuichi Kakuta, deceased, late of Fukushima, both of Japan (by Rokuroh Kakuta, legal representative), assignors to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Continuation of Ser. No. 852,150, Apr. 15, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 256,830

Claims priority, application Japan, Apr. 19, 1985, 60-82273; Jul. 12, 1985, 60-152169; Aug. 16, 1985, 60-179494

Int. Cl.[4] G11B 5/55

U.S. Cl. 360—106 **18 Claims**



1. A magnetic disc unit comprising:

means for driving a magnetic disc;

magnetic head means including a first magnetic head and a second magnetic head for recording and/or reproducing information on opposite surfaces of said magnetic disc;

magnetic head driving means for transferring said first and second magnetic heads to predetermined position on said magnetic disc;

a temperature-compensating member for compensating relative misalignment between said first and second magnetic heads due to a variation in temperature;

a first magnetic head supporting member supporting said first magnetic head and being mounted on said magnetic head driving means via said temperature-compensating member; and

a second magnetic head supporting member supporting said second magnetic head and being mounted on said magnetic head driving means via said temperature-compensating member, wherein said first and second magnetic head supporting members are mounted on said temperature-compensating member at positions separated from each other by a distance corresponding to the difference in the thermal expansion coefficients of said first and second magnetic head supporting members.

4,881,143

COMPENSATED MAGNETO-RESISTIVE READ HEAD

Manoj K. Bhattacharyya, Cupertino, Calif.; Robert J. Davidson, Eagle, Id., and Hardayal S. Gill, Los Altos, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 19, 1988, Ser. No. 145,784

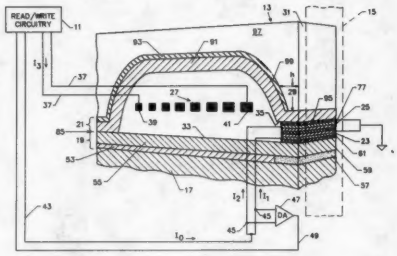
Int. Cl.[4] G11B 5/12

U.S. Cl. 360—113 **9 Claims**

1. A device comprising:

read means for modulating a voltage drop imposed on an electrical read current to provide a signal as a function of flux levels stored in a magnetic medium moving relative to said read means, said read means including input means for receiving said read current, said read means including output means for transmitting said signal;

shield means for isolating said read means from magnetic fields from sources other than a portion of said magnetic medium at a predetermined location relative to said read



means, said shield means being positioned with respect to said read means so that said read current induces a magnetic field in said shield means; and

cancellation means for substantially cancelling said magnetic field in said shield means.

4,881,144

THIN FILM MAGNETIC HEAD

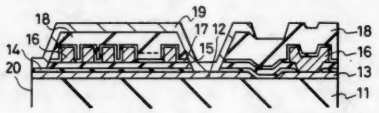
Isamu Yuito; Eijin Moriwaki, both of Hachiouji; Kazuo Shiiki, Kanagawa; Yoshihiro Hamakawa, Koganei, and Hisashi Takano, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 142,697

Claims priority, application Japan, Jan. 19, 1987, 62-8031

Int. Cl.[4] G11B 5/16

U.S. Cl. 360—125 **12 Claims**



1. In a thin film magnetic head including a lower magnetic pole formed on a substrate, a gap layer, a first, insulating layer, a coil formed on said first insulating layer, a second insulating layer formed on said first insulating layer and on said coil, and an upper magnetic pole, the improvement wherein a surface active layer is formed having opposite sides wherein one side is sequentially contiguous to both said first insulating layer and said coil and the other side of said surface active layer is contiguous to said second insulating layer.

4,881,145

TAPE GUIDE MECHANISM

Mark A. Hathaway, Newark, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 10, 1987, Ser. No. 36,762

Int. Cl.[4] G11B 15/60

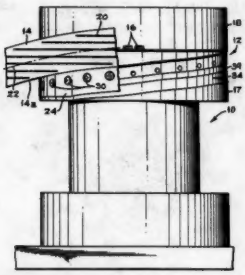
U.S. Cl. 360—130.24 **3 Claims**

1. In a head assembly for a recording and reproducing apparatus for the storage and retrieval of information on a tape medium, including a cylindrical drum to position the tape medium for movement on a path defined on a tape-bearing surface of the drum, a guide mechanism tracing said path on the drum surface, said guide mechanism comprising:

an inwardly directed step formed in the tape-bearing surface of the drum, said step having an upper face and including

a second recessed channel portion disposed contiguous to the upper face, said step following said path of the tape medium; and

a guide band mounted on the drum to define the position of the tape path around the drum, an upper face of the guide band received in the second recessed channel portion of the step, to be disposed adjacent the upper face of the step,



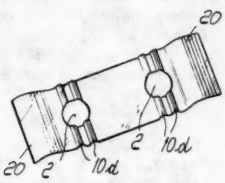
to be provided a shelf which supports the tape medium at a lower edge thereof, and to minimize gaps between the guide band and the step, thereby to prevent the tape medium from being trapped between the guide band and the drum surface, as the tape medium moves along said guide band, and to fully support the tape medium both on the guide band and at the drum surface.

4,881,146

MASK FOR MAGNETIC TAPE CASSETTES

Abramo Bordignon, Senago, Italy, assignor to A.T.B. S.P.A., Senago Mi, Italy

Filed Nov. 23, 1987, Ser. No. 124,194
Claims priority, application Italy, Dec. 4, 1986, 22582 A/86
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—132 **9 Claims**



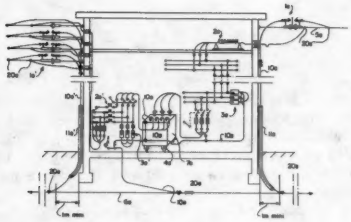
1. Mask for magnetic tape cassettes of the type comprising reels of magnetic tape in a box-like cassette shell having a middle plane and inner walls, wherein the reels have hubs defining axial ends having a peripheral region and the magnetic tape has longitudinal edges and defines windings on said reels, said mask comprising a sheet-like element having a longitudinal extension and being insertable between said axial ends of said reels of magnetic tape and said inner walls of said box-like cassette shell, and a pair of holes formed in said sheet-like element and being located at said hubs of said reels, wherein said sheet-like element defines at least one centering ridge having a high degree of elastic rigidity and at least partially engaging said peripheral region of said axial ends for centering said hubs with respect to said middle plane of said box-like cassette shell, and at least one alignment ridge having a low degree of elastic rigidity and being engagable with said longitudinal edges of said magnetic tape for aligning said winding, wherein said at least one centering ridge and said at least one alignment ridge extend substantially perpendicular to said longitudinal extension of said sheet-like element.

4,881,147

PROTECTION OF SENSITIVE ELECTRICAL INSTALLATIONS AGAINST THE EFFECTS OF LIGHTNING, AND DEVICES PROPOSED FOR SUCH ARRANGEMENT

Jean-Paul Schaff, 18 avenue des Tilleuls, F-63400 Chamalieres, France

Filed Mar. 2, 1987, Ser. No. 9,331
Int. Cl.[4] H02H *1/04*
U.S. Cl. 361—118 **13 Claims**



1. Arrangement for the protection of an installation for transformation of electric current of similar installation connected to an overhead line, characterized:

in that the electrical relation between the line and the installation comprises for each of the phases:

at least a first set of arresters connected to the line, a first grounding conductor insulated for a minimum of 1,000 V for connecting the first set of arresters to ground,

at least a first inductance coil connected to the first set of arresters and having a winding of approximately fifty loops 25 to 30 centimeters in diameter, the loops being insulated from one another to at least 1,000 V in permanent tension,

at least one variable resistance arrester conected to the inductance coil, and

a second grounding conductor insulated for a minimum of 1,000 V for connecting the variable resistnace arrester to ground.

4,881,148

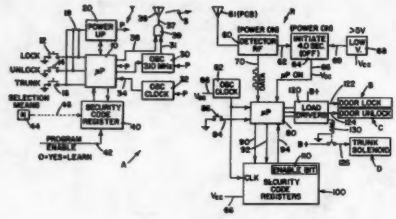
REMOTE CONTROL SYSTEM FOR DOOR LOCKS

George Lambropoulos, Grosse Pointe Woods; Kenneth R. Pitera, Warren, and Robert A. Hair, Pontiac, all of Mich., assignors to Wickes Manufacturing Company, Southfield, Mich.

Continuation of Ser. No. 052,469, May 21, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 262,206
Int. Cl.[4] H01G *1/06*
U.S. Cl. 361—172 **36 Claims**

1. In a remote control system including a receiver unit adapted to be fixedly mounted onto a motor vehicle having at least one door lock with a first locked condition and a second unlocked condition, said receiver unit including means for receiving a coded signal including a code portion of binary bits, memory means for storing a first code of binary bits, means for comparing the code portion of a received coded signal with said first code and means for shifting said door lock to one of said conditions upon a comparison match between said code portion of a received signal and said stored first code; and a transmitting unit including means for storing a second code of binary bits, selector means for indicating a desire to shift said door lock into one of said conditions, means responsive to said selector means for transmitting a coded signal including said second code as the code portion of the transmitted signal, which transmitted signal has a signal strength suffi-

cient to drive said receiving means when said transmitting unit is in proximity to said receiver unit, the improvement comprising: programming means for establishing said stored first code, said programming means including field programming means for permitting entry of said coded portion of said received



coded signal into said memory means to establish said first code as corresponding to said coded portion of said received signal, said field programming means including switch means associated with said receiver unit for permitting said entry of said coded portion only when said switch means is manually operated.

4,881,149

MOLDED CAPACITOR

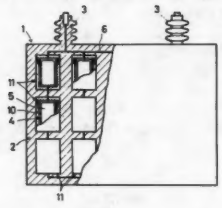
Koichi Tokura, Osaka, and Goro Matsui, Amagasaki, both of Japan, assignors to Risho Kogyo Co., Ltd., Osaka, Japan

Filed Oct. 12, 1988, Ser. No. 262,736

Claims priority, application Japan, Oct. 23, 1987, 62-162873; Oct. 27, 1987, 62-163767; Feb. 2, 1988, 62-23427

Int. Cl.[4] H01G *4/38*

U.S. Cl. 361—328 **10 Claims**



1. A capacitor, comprising:

a plurality of inner casings, each said inner casing made of a relatively rigid material, and each said inner casing comprising a body portion having an open end and a lid portion covering said open end of said body portion;

a plurality of capacitor elements, one said capacitor element disposed in each said inner casing;

lead wires electrically connecting said plurality of capacitor elements with one another in an assembly;

each said lid having a hole therethrough and each said body portion having a hole therethrough in a bottom portion thereof for receiving said lead wires therethrough, each said hole sized so as to have a first gap between the wall of said hole and a said lead wire received therethrough, and each said inner casing having a second gap between its body portion and its respective lid portion, said first and second gaps sized sufficiently small so as to allow an electrically insulating gas to pass into said inner casing but sufficiently large so as to prevent molten synthetic resin from passing into said inner casing;

each said inner casing having an electrically insulating gas therein; and

an outer casing comprising molded synthetic resin surrounding said plurality of inner casings and sealing said electrically insulating gas in said plurality of inner casings.

4,881,150

HOUSING AND HOLDER ASSEMBLY FOR A PORTABLE COMMUNICATION APPARATUS

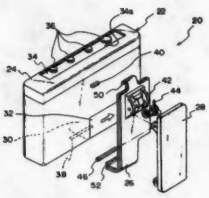
Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,493

Claims priority, application Japan, Jul. 10, 1987, 62-105208[U]

Int. Cl.[4] H05K *7/00*

U.S. Cl. 361—392 **7 Claims**



1. A housing and holder assembly for a portable communications apparatus, comprising:

a housing accommodating said apparatus;

a battery cover forming a part of said housing and slidable relative to said housing into and out of engagement with said housing, said battery cover closing a bore which is defined in said housing for receiving a battery which powers said apparatus;

a holder removably mounted on said housing and, when mounted on said housing, engaging said housing in at least two places such that at one of said at least two places the holder contacts both said housing and said battery cover simultaneously; and

locking means associated with said one of said at least two places for, when said holder is mounted on said housing, locking said holder in position such that said battery cover is removable from said housing with the holder being held in engagement with said housing, removal of said battery cover facilitating detachment of said holder from said housing.

4,881,151

ELECTROLYTIC FOIL CAPACITOR

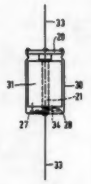
Johannus W. Weekamp; Benedictus C. H. Fransen, and Hendrik van der Ploeg, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 15, 1989, Ser. No. 311,560

Claims priority, application Netherlands, Mar. 7, 1988, 8800558

Int. Cl.[4] H01G *9/00*

U.S. Cl. 361—531 **3 Claims**



1. An electrolytic foil capacitor comprising a metal housing

which is open on one side and which is provided on said side with a seal of electrically insulating material, said housing containing, wound around a formed metal pin, an assembly of a strip of an anode foil provided with a dielectric oxide layer, two or more strips of separator foils impregnated with an electrolyte liquid, and a strip of a cathode foil, which are wound together to form a roll, the metal pin being lead outwards through the seal on the open side of the housing, and the cathode foil being provided with a first tag protruding from the roll, said tag being mechanically and electrically connected to the housing, characterized in that the roll is mechanically connected to the metal pin via a short side of a strip of a separator foil, and that the anode foil is provided with a second tag projecting from the roll, which tag is mechanically and electrically connected to the metal pin.

4,881,152

HEADLIGHT FOR AUTOMOBILE

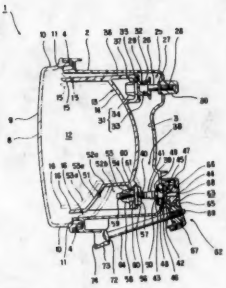
Shinji Watanabe, and Akira Saijo, both of Shizuoka, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 245,989

Claims priority, application Japan, Sep. 22, 1987, 62-145531[U]; Jun. 21, 1988, 63-152973

Int. Cl.[4] B06Q *1/06*; F21V *3/18*

U.S. Cl. 362—61 **6 Claims**



1. A headlight device for use in an automobile, comprising:

a lamp body having a recess which opens forward with respect to a vehicle onto which the headlight device is to be mounted;

a lens covering the recess of the lamp body;

a reflective mirror tiltably supported in the lamp body;

one rotatable support portion and two space adjusting portions for supporting the reflective mirror on the lamp body, each space adjusting portion comprising a nut member supported on the lamp body and having a front and rear end with respect to the vehicle onto which the headlight device is to be mounted and a screw-thread portion for screw-threadingly engaging with the nut member, a gear unit consisting of two intermeshing bevel gears, one of said bevel gears, being connected to the rear end of the adjusting rod, and an actuating rod having a front end located near to a front end of a side surface of the lamp body and a rear end connected to the other bevel gear of the gear unit with respect to the vehicle onto which the headlight device is to be mounted; and

a recessed portion formed in the reflective mirror and in front of each of the nut members with respect to the vehicle onto which the headlight device is to be mounted.

4,881,153

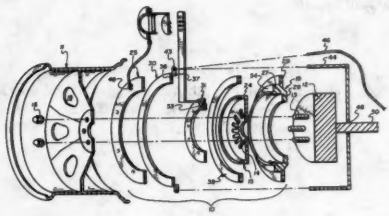
VEHICLE WHEEL LIGHTING SYSTEM

Russell E. Scott, Salt Lake City, Utah, assignor to David Duane Scott, Draper, Utah

Filed Jan. 17, 1989, Ser. No. 297,400

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 362—78 **14 Claims**



1. A wheel lighting apparatus for mounting on a vehicle having at least one wheel which is rotatable with respect to a nonrotating portion of the vehicle, one wheel hub with lug bolts, and a source of electrical power, said apparatus comprising:

disk means comprising

an electrically conductive first ring which is rotatable with the wheel of the vehicle, and

an electrically conductive second ring which is attachable to a nonrotating portion of the vehicle so as to be generally coaxial with said first ring and in continuous sliding electrical contact therewith as the wheel rotates,

mounting means for attaching said first ring to a hub of the vehicle,

light means attachable to said mounting means to rotate as the hub and wheel are rotated and responsive to electrical power for producing light, and

means for electrically coupling said light means to said first ring so that electrical power supplied from the vehicle power source to said second ring is thereby supplied via said first ring to said light means.

4,881,154

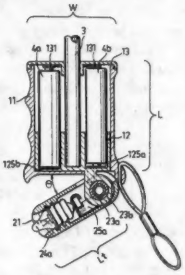
ILLUMINATING UMBRELLA HANDLE

Su Tseng, No. 6, Niu Pu Road, and Wan S. Chien, No. 25-1, Chung Hsiao Road, both of Hsinchu City, Taiwan

Filed May 17, 1988, Ser. No. 194,958

Int. Cl.[4] A45B *3/02*; A63B *15/02*

U.S. Cl. 362—102 **1 Claim**



1. An umbrella handle for an umbrella having a shaft which is mounted on said handle, said handle being in form of a substantially rectangular hollow body of length L, width W and thickness T, wherein L slightly outsizes the length of a standard dry battery, said handle being provided with an illuminating means pivotable in a plane perpendicular to the direction of the thickness of said handle, the length of said illuminat-

ing means being not greater than W, and the thickness of said illuminating means being not greater than T, said handle being so structured as to receive said shaft while defining two spaces one on each side of said shaft sufficient to respectively receive a standard dry battery, said handle being provided with terminal means which are so structured that said lighting means is only energized when batteries are loaded in said spaces and when said illuminating means is privoted a specific angle away from said handle.

4,881,155

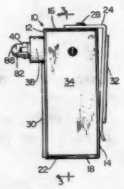
MULTIPURPOSE FLASHLIGHT

William L. Gahagan, 8612 - 16th Ave. NE., Seattle, Wash. 98106

Filed Feb. 7, 1989, Ser. No. 307,756

Int. Cl.[4] F21L *15/08*

U.S. Cl. 362—191 **16 Claims**



1. A multipurpose flashlight comprising:

a flashlight bulb;

a housing means; wherein said housing means further includes a flashlight bulb socket means for mounting said flashlight bulb; and wherein said housing means defines an internal compartment that is sized and shaped to be adapted to receive at least one battery;

an electrical switch means mounted to said housing means; and

electrical circuit means for electrically connecting said flashlight bulb, said at least one battery and said switch means to enable said at least one battery to supply electricity to said flashlight bulb when said switch means is on and to prevent said at least one battery from supplying electricity to said flashlight bulb when said switch means is off;

wherein said flashlight further comprises first and second magnets; wherein said first magnet is secured to a first magnet side of said housing means; wherein said second magnet is secured to a second magnet side of said housing means; wherein said first magnet has a strength that is sufficient to be adapted to magnetically fasten said flashlight in any orientation to a magnetically responsive surface to help permit a user to aim light emitted from said flashlight on a work surface; and wherein said second magnet is secured to said second magnet side of said housing means to help permit said user to more conveniently use said second magnet to magnetically hold objects for said user.

4,881,156

ADJUSTABLE MOUNTING DEVICE FOR A LUMINAIRE

Sylvan R. Shemitz, Woodbridge; Theodore Lepak, and Steve Smith, both of Meriden, all of Conn., assignors to Sylvan R. Shemitz Associates, Inc., West Haven, Conn.

Filed May 22, 1987, Ser. No. 53,045

Int. Cl.[4] F21V *3/02*

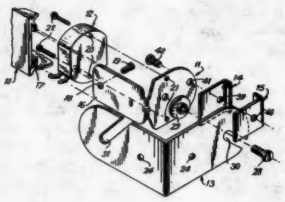
U.S. Cl. 362—220 **6 Claims**

1. An adjustable mounting device for a luminaire, comprising:

(a) an elongated reflector having a long axis and adapted to receive the adjustable mounting device at each end thereof;

(b) mounting straps attached at each end of the reflector coaxially with the long axis of the reflector;

(c) lampholders attached to mounting straps coaxially with the long axis of the luminaire;



(d) mounting brackets attached at each end of the reflector coaxially with the long axis of the reflector; and

(e) locking means, separate from the mounting brackets, attached to mounting straps at each end of the reflector offset from the long axis of the reflector.

4,881,157

ADJUSTABLE LIGHT FIXTURE

Scott T. Pahl, San Ramon, Calif., assignor to USI Lighting, Inc., San Leandro, Calif.

Filed Apr. 27, 1989, Ser. No. 344,812

Int. Cl.[4] F21V *21/04*

U.S. Cl. 362—371 **10 Claims**

1. An adjustable light fixture comprising:

a housing member having a pair of longitudinal slots;

a slide member positioned inside said slots and having a central aperture;

a lever member pivotally connected to said housing and having a first end positioned inside said central aperture; and

a lamp assembly connected to said slide member.

4,881,158

FLASHLIGHT SWITCH WITH SPARE BULB CARRIER

George T. Price, III, 2227 E. 37th St., Los Angeles, Calif. 90058

Continuation of Ser. No. 107,781, Oct. 13, 1987, Pat. No. 4,843,526. This application May 3, 1989, Ser. No. 346,641

Int. Cl.[4] F21L *7/00*

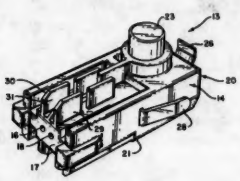
U.S. Cl. 362—207 **6 Claims**

1. A bulb and switch assembly comprising:

a bulb having first and second leads,

a fixed switch body having a first terminal and a conductor,

means for mounting said bulb on said switch body with the first lead contacting the first terminal and the second lead



contacting the conductor and further including means for storing a spare bulb on the switch body.

4,881,159

SWITCHING-RELIEVED LOW-LOSS THREE-LEVEL INVERTER

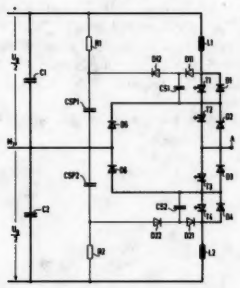
Joachim Holtz; Samir Salama, both of Wuppertal, and Theodor Salzmann, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 288,284

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3742437; Dec. 21, 1987, 3743436

Int. Cl.[4] H02M 7/521

U.S. Cl. 363—58 **14 Claims**



1. A three-level inverter, comprising:

at least one inverter phase having a series arrangement of first, second, third and fourth antiparallel circuits, each antiparallel circuit including a semiconductor switching element and a bypass diode;

a phase output formed by a junction point of said second and third antiparallel circuits;

a d-c voltage source which supplies voltage to the phase;

first and second switching-on relief chokes which couple said series arrangement to the positive and negative potentials of the d-c voltage source;

first and second voltage divider capacitors coupled to be supplied by the d-c voltage source, with a junction point formed between said first and second voltage divider capacitors;

a first decoupling diode coupled between said junction point between said first and second voltage divider capacitors and a junction point between said first and second antiparallel circuits;

a second decoupling diode coupled between said junction point between said first and second voltage divider capacitors and a junction point between said third and fourth antiparallel circuits; and

means for relieving the semiconductor switching elements during a switching-off process, said means for relieving including:

a first series circuit having a first wiring diode and a first switching-off relief capacitor, which said first series circuit shunts said first antiparallel circuit;

a second series circuit having a second wiring diode and a second switching-off relief capacitor, which said second series circuit shunts said fourth antiparallel circuit;

a third series circuit having a first storage capacitor and a first d-c load, which said third series circuit is shunted across said first voltage divider capacitor;

a fourth series circuit having a second storage capacitor and a second d-c load, which said fourth series circuit is shunted across said second voltage divider capacitor;

a third wiring diode coupled between the junction point of the first wiring diode and the first switching-off relief capacitor and the junction point of the first storage capacitor and the first d-c load; and

a fourth wiring diode coupled between the junction point of the second wiring diode and the second switching-off relief capacitor and the junction point of the second storage capacitor and the second d-c load.

4,881,160

SELF-TUNING CONTROLLER

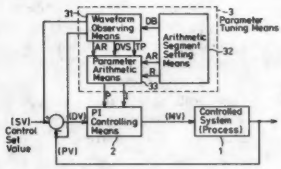
Yoshikatsu Sakai; Yasuo Nakai; Asao Miyabe, and Takafumi Kawano, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,915

Claims priority, application Japan, Mar. 9, 1987, 62-53494; Apr. 20, 1987, 62-97165

Int. Cl.[4] G05B 13/00

U.S. Cl. 364—161 **12 Claims**



1. A self tuning controller comprising

PI controlling means for outputting a manipulated variable to a controlled system, said PI controlling means comprising means for obtaining said manipulated variable by performing at least proportional integral arithmetic on a deviation signal between a control set value and a process variable from a process; and

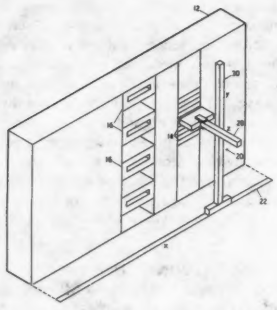
parameter tuning means for tuning said PI arithmetic parameters of said PI controlling means, said parameter tuning means comprising means for observing a waveform of said process variable or said deviation signal, and means for taking an observed result of said process variable or said deviation signal and for producing a preset response target;

wherein said parameter tuning means comprises waveform observing means for computing a first area associated with said process variable or said deviation signal extending from a first generation timing (t_1) of a first peak of said process variable or said deviation signal to a subsequent second generation timing (t_2) of a second peak and a second area associated with said process variable or said deviation signal extending from said second generation timing to a subsequent timing given by $t_2+(t_2-t_1)$, and for outputting an area ratio of said first area to said second area, as one of a plurality of evaluation indexes representing waveform patterns, and parameters arithmetic means for computing said PI arithmetic parameters on the basis of said evaluation indexes, including said area ratio, given by said waveform observing means.

4,881,161
STEPPING MOTOR CONTROL

Murray A. Thompson, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 29, 1988, Ser. No. 149,713
Int. Cl.[4] G05F *1/00*
U.S. Cl. 364—167.01 19 Claims



1. A stepping motor control circuit for operating a stepping motor under the control of a digital computer, the stepping motor having at all times a current velocity and a current position, the circuit comprising

an input latch connected to receive two input values from the computer, one input value being desired velocity and the other input value being rate of change of velocity;

a velocity register holding a value corresponding to the current velocity of the stepping motor;

an adder to add the value of the rate of change of velocity to the value in the velocity register;

a position register holding a value corresponding to the current position of the stepping motor;

an adder to add the value of the current velocity to the value in the position register;

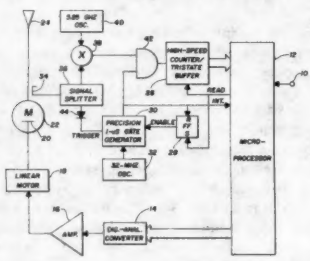
a digital-to-analog converter to convert the value in the position register to an analog voltage for the motor; and

a drive circuit connected to the output of the digital-to-analog converter to receive the analog output thereof and amplify it to drive the stepping motor.

4,881,162
FREQUENCY CONTROL SYSTEM

Frederick G. Reinagel, Erie, N.Y., assignor to LTV Aerospace & Defense Co., Dallas, Tex.

Filed Mar. 15, 1988, Ser. No. 168,447
Int. Cl.[4] H03B *9/10;* H01J *25/50*
U.S. Cl. 364—176 34 Claims



1. A frequency control system for controlling, under a wide variety of environmental conditions, the output frequency of a coaxial magnetron having a mechanically positionable tuning member, said frequency control system comprising:

programmable logic means, responsive to a frequency command signal, for generating a positioning signal derived from the frequency command signal, where the initial value of the positioning signal is functionally related to stored nominal magnetron tuning data;

driver means, intercoupling the programmable logic means and the tuning member of the magnetron, for positioning the tuning member in response to positioning signals generated by said programmable logic means;

sensor means, responsive to the output of the magnetron for sensing the output of the magnetron and producing a signal representative thereof;

measurement means, connected to said sensor means, for measuring the frequency of the sensor output signal and supplying a feedback signal to the programmable logic means; and

said programmable logic means being operative to compare the frequency command signal with the frequency of the sampled magnetron output, modify a resident dynamic calibration function according to any difference detected in the comparison, and generate a revised positioning signal based on the modified calibration function to thereby iteratively tune the output frequency of the coaxial magnetron.

4,881,163
COMPUTER SYSTEM ARCHITECTURE EMPLOYING CACHE DATA LINE MOVE-OUT QUEUE BUFFER

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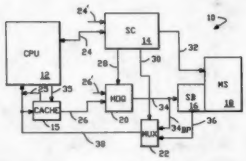
Filed Sep. 19, 1986, Ser. No. 909,500
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 10 Claims



1. A queue buffer for preventing mainstore memory access contention between data line move-out and move-in requests issued from any of a plurality of logical request sources during an arbitrated request acceptance cycle, the requests including a data move-out request for the transfer of a data line present in a cache memory of a central processor to a mainstore memory, and a move-in request, specifying a data line by an address tag, for transfer to the cache memory, said queue buffer comprising:

(a) a first buffer memory having a plurality of data line storage locations;

(b) a second buffer memory having a plurality of address tag storage locations;

(c) control means for receiving and executing requests received from the plurality of logical request sources, said control means receiving the requests in the performance of an arbitrated request acceptance cycle wherein a received request is selected for execution, said control means including means for receiving a cache data line and address tag provided with a first data move-out request, said control means receiving and storing said cache data line at a first storage location within said first buffer memory and the address tag of said cache data line at a corre-

sponding storage location within said second buffer memory; and

(d) background means, coupled to said control means as one of the plurality of logical request sources, for providing a second data move-out request to said control means for the transfer of a data line and address tag to said mainstore memory, said background means being coupled to said control means for determining the number of data lines stored in said first buffer means, said background means providing said second data move-out request to said control means during each arbitrated request acceptance cycle when more than a predetermined number of data lines are stored in said first buffer memory, said background means issuing said second data move-out requests at a priority less than that of said first move-out request and that of requests for the move-in data from mainstore memory.

4,881,164

MULTI-MICROPROCESSOR FOR CONTROLLING SHARED MEMORY

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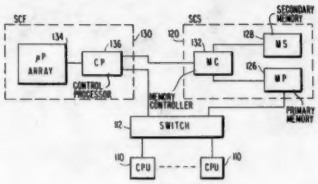
Continuation of Ser. No. 567,304, Dec. 30, 1983, abandoned. This application May 18, 1987, Ser. No. 51,178

Int. Cl.[4] G06F *13/14*

U.S. Cl. 364—200 **25 Claims**



1. A data processing system of the type including at least one intelligent terminal, a memory for storing data and control means for performing at least one memory control function in accordance with data requests from said terminal, said control means comprising a plurality of microprocessors for performing said at least one memory control function in accordance with said data requests and interconnected in an array for communication between one another, each microprocessor performing its control function with respect to a respective area of said memory and a control processor responsive to a request for data from said at least one intelligent terminal for determining which one of said microprocessors is responsible for the requested data, and for forwarding said request for data to said one microprocessor.

4,881,165

METHOD AND APPARATUS FOR HIGH SPEED DATA TRANSMISSION BETWEEN TWO SYSTEMS OPERATING UNDER THE SAME CLOCK WITH UNKNOWN AND NON CONSTANT SKEW IN THE CLOCK BETWEEN THE TWO SYSTEMS

David J. Sager, Acton; Anne S. Valiton, Westboro, both of Mass.; Jay C. Stickney, Derry, N.H., and Raj K. Ramanujan, Leominster, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 1, 1988, Ser. No. 176,474

Int. Cl.[4] G06F *15/00*; H04L *7/00*

U.S. Cl. 364—200 **13 Claims**

6. A digital system which comprises:

(a) a first system;

(b) a second system;

(c) a data transmission line coupling the first system to the second system;

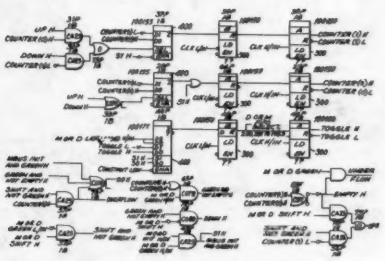
(d) a data forwarding signal line coupling the first system to the second system;

(e) a clock signal having a cycle time, coupled to the first system and the second system wherein there is a nonconstant and unknown skew in the clock signal between the first and second systems;

(f) the first system operating to continuously transmit a series of data items across the data transmission line to the second system as a function of the clock signal in the first system;

(g) the first system operating to transmit a data forwarding signal across the data forwarding signal line to the second system;

(h) a first state device in the second system coupled to the data transmission line, the data forwarding signal operating to enable the first state device to capture each one of the series of data items;



(i) a second state device in the second system coupled to the data forwarding signal line, the data forwarding signal operating to enable the second state device to generate a binary signal which inverts to indicate an instant of time when each one of the series of data items is received in the first state device;

(j) the second state device being coupled to a synchronizer, the synchronizer operating to synchronize the binary signal to the clock signal of the second system;

(k) a third state device being coupled to the first state device and the synchronizer;

(l) the clock signal of the second system and the synchronized binary signal operating to enable the third state device to capture each one of the series of data items from the first state device such that the synchronized binary signal determines which one of the cycles of the clock signal of the second system should be used to capture each one of the series of data items.

4,881,166

METHOD FOR CONSISTENT MULTIDATABASE TRANSACTION PROCESSING

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Filed Jul. 24, 1987, Ser. No. 78,129

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **11 Claims**

1. A concurrency control method for permitting the correct execution of multiple concurrent transactions, each comprising one or more read and/or write operations, in a distributed heterogeneous database system, comprising:

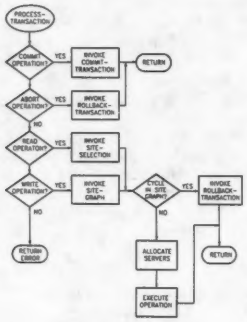
(a) upon receipt of a read operation request, identifying the sites in the system that contain data needed for the read operation;

(b) determining if the transaction including the read opera-

tion request has processed a previous operation at any of the identified sites;

(c) for the condition of step (b) where a previous operation has been processed, perform the read operation;

(d) for the condition of step (b) where a previous operation has not been processed, select a site from the identified sites and determine if a site cycle occurs at the selected site;



(e) for the condition of step (d) where a site cycle occurs, select another site from the selected sites and redo step (d);

(f) for the condition of step (d) where no site cycle occurs at one of the sites, perform the read operation at that selected site; and

(g) for the condition of step (d) where a site cycle occurs for all selected sites, cancel the transaction.

4,881,167

DATA MEMORY SYSTEM

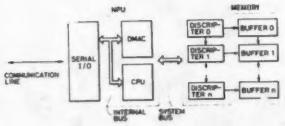
Hisao Sasaki, Tachikawa; Matsuaki Terada, Machida; Susumu Matsui, Sagamihara; Kenji Kawakita, Yokohama; Jiro Kashio, Kawasaki; Shiro Baba, Tokorozawa, all of Japan; Yasushi Akao, Ithaca, N.Y., and Toshio Okochi, Ohme, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 63,081, Jun. 17, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 318,439

Claims priority, application Japan, Jun. 18, 1986, 61-140062

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—200 **21 Claims**



1. A data memory system comprising:

a plurality of buffer regions, each buffer region having a respectively predetermined memory capacity for storing data;

a like plurality of descripter regions, each descripter region corresponding with a respective one of said plurality of buffer regions, each descripter region including a first portion for containing buffer region addressing information, designating the address of the corresponding one of said plurality of buffer regions, and a second portion for containing chain information, designating the address of another descripter region to be linked to said each descripter region so that said each descripter region is capable of being linked to another descripter region, allowing data stored in said buffer regions to be linked on the basis of the chain information in said descripter regions.

4,881,168

VECTOR PROCESSOR WITH VECTOR DATA COMPRESSION/EXPANSION CAPABILITY

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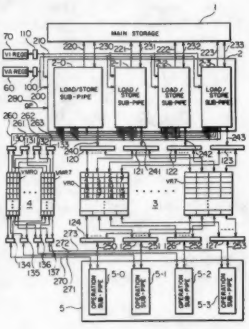
Filed Apr. 6, 1987, Ser. No. 34,950

Claims priority, application Japan, Apr. 4, 1986, 61-76528

Int. Cl.[4] G06F *12/00, 15/347*

U.S. Cl. 364—200 **6 Claims**



1. A vector processor, comprising:

(a) a memory for holding data;

(b) at least one vector register including means for holding a set of vector elements and means for reading out said vector elements sequentially in groups in response to a store compression instruction, wherein each group comprises m ($m>1$) vector elements which are read out in parallel;

(c) at least one vector mask register including means for holding a set of mask bits each corresponding to one vector element of the set of vector elements, each mask bit comprising a valid mask bit or an invalid mask bit, and means for reading out the set of mask bits sequentially in groups in response to said store compression instruction, wherein each group comprises m mask bits corresponding to a respective group of m vector elements, wherein a respective group of m mask bits are read out in parallel and in synchronism with read out of a corresponding group of vector elements;

(d) store means connected to said memory, said vector register and said vector mask register and responsive to said store compression instruction for selectively writing vector elements, within a set of vector elements currently read out of said vector register and corresponding to valid mask bits within the corresponding set of mask bits, into regularly spaced storage locations of said memory;

(d1) wherein said store means comprises first to m-th parallelly operable access means, wherein an i-th ($1 \leqq i \leqq m$) access means includes means for writing into said memory an i-th vector element of a respective group of vector elements currently read out from said vector register, in response to an i-th mask bit of a group

of corresponding mask bits currently read out from the mask register when said i-th mask bit is a valid mask bit;

(d2) wherein said first access means includes means for generating an address of a storage location of said memory into which a first vector element of the read out group of vector elements is to be written when a first mask bit of the read out mask bits is a valid mask bit included in all groups of m mask bits read out before the currently read out group of m mask bits;

(d3) wherein each j-th ($2 \leqq j \leqq m$) access means includes means for generating an address of a storage location of said memory into which a j-th vector element of the currently read out group of vector elements is to be written when a j-th mask bit of the currently read out group of m mask bits is a valid mask bit, depending upon said total number of valid mask bits in all previously read out groups of mask bits and upon a total number of valid or invalid mask bits included in the first to (j − 1)th mask bits included in the currently read out m mask bits.

4,881,169

APPARATUS FOR CONTROLLING PERIPHERAL EQUIPMENT

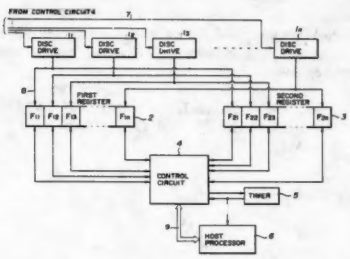
Shigenobu Tanaka, and Tomohisa Arai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,015

Claims priority, application Japan, Nov. 10, 1986, 61-268218

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—200 **5 Claims**



1. An apparatus for controlling peripheral equipment, said apparatus comprising:

driving means for driving a plurality of peripheral equipment,

first storing means for storing first data indicating which peripheral equipment is under operation,

second storing means for storing second data,

a timer counting a time and producing a time over signal when said time becomes equal to a predetermined time, and

control means, connected to said driving means, said first and second storing means, and said timer, for controlling operation of said driving means, said first and second storing means, and said timer, said control means controlling said second storing means to store said first data which is stored in said first storing means into said second storing means when all of said second data has a predetermined value, said control means controlling said timer to start counting when any of said second data has a value other than said predetermined value.

4,881,170

INSTRUCTION PREFETCH CONTROL APPARATUS

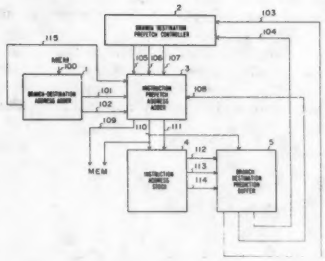
Tsuyoshi Morisada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 117,152

Claims priority, application Japan, Feb. 28, 1986, 61-44478; Feb. 28, 1986, 61-44479

Int. Cl.[4] G06F *9/38*

U.S. Cl. 364—200 **2 Claims**



1. An instruction prefetch control apparatus having a branch history table storing a paired branch instruction address and a branch destination address of a branch instruction for performing prefetch control of an instruction, said branch history table also storing said branch instruction and instruction-number-information, comprising:

readout means for reading out said branch instruction from said branch history table in accordance with an instruction prefetch address;

means for storing a number of instructions for indicating a number of possible instruction prefetches from a branch destination in said branch history table depending on said branch destination address;

instruction-number-information storing means for storing said instruction-number-information obtained from said branch history table; and

inhibiting means for inhibiting the number of instruction prefetches of a predicted branch destination on the basis of said instruction-number-information from said instruction-number-information storing means.

4,881,171

SCINTILLATION CAMERA HAVING SIMPLIFIED ELECTRONIC CONTROL

Michel R. Jatteau; Pierre H. Lelong, both of Paris; Vincent Pauzat, Montgeron, and Christian Plard, Rueil-Malmaison, all of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 8, 1987, Ser. No. 71,222

Claims priority, application France, Jul. 9, 1986, 86 09986; Jul. 16, 1986, 86 10326

Int. Cl.[4] G01T *1/20, 1/208*

U.S. Cl. 364—413.24 **21 Claims**

1. A scintillation camera comprising a collimator directing photons, a scintillation crystal converting each photon received from said collimator into a scintillation, a light guide for coupling said crystal to an entrance window of an array of p photodetectors, said photodetectors converting each scintillation into a current, p acquisition channels receiving output signals of said photodetectors and supplying p characteristic electric signals relating to the intensity of the scintillation and to each distance between each respective scintillation and each of the photo-detectors, and a processor supplying coordinates x_j and Y_j of a scintillation j and its associated energy E_j, characterized in that:

(A) said p acquisition channels sample said output signals of the photo-detectors, followed by A/D conversion of said

samples and summing of said samples, and apply p digital signals to an output of said processor;

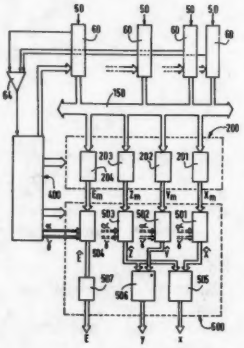
(B) said processor comprises:

(i) a bus for transferring said p digital signals;

(ii) a digital summing stage comprising four digital weighted sum forming devices supplying four digital signals X_m, Y_m, Z_m, E_m on the basis of said output signals of said p acquisition channels;

(iii) a scintillation processing stage including a plurality of unpiling calculation circuits and two dividers, said scintillation processing stage supplying three coordinate and energy signals x, y, E on the basis of said digital signals X_m, Y_m, Z_m, E_m; and

(C) a detection, sequencing and storage stage is provided in order to supply various clock signals for synchronizing elements of said p acquisition channels and elements of said processor, and to supply correction coefficients for



said scintillation processing stage, said detection, sequencing and storage stage receiving a signal corresponding to a sum of the p output signals of said photodetectors, and characterized in that said scintillation processing stage comprises four unpiling calculation circuits receiving said digiatl signals X_m, Y_m, Z_m, E_m, respectively and supplying four signals X, Y, Z, E, and wherein said two dividers supply two signals $x=X/Z$ and $y=Y/Z$, respectively, said three signals x, y, E being formed by output signals of a first divider of said two dividers, a second divider of said two dividers, and a time realignment circuit, respectively, said time realignment circuit receiving an output signal of one of said four unpiling calculation circuits, said correction coefficients being coefficients for correction by extrapolation and interpolation, α and γ, respectively, and intended for said four unpiling calculation circuits of said scintillation processing stage.

4,881,172

OBSERVER CONTROL MEANS FOR SUSPENSION SYSTEMS OR THE LIKE

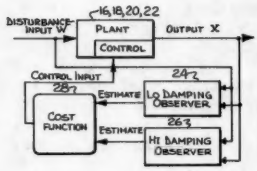
Lane R. Miller, Cary, N.C., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 22, 1986, Ser. No. 945,380
Int. Cl.[4] B60G *17/00*
U.S. Cl. 364—424.05 **23 Claims**

1. Apparatus for controlling operation of a suspension system having semiactive damper means, said damper means being adjustable to permit operation thereof in different modes of operation, adjustments of said damper means causing said damper means to operate in different ones of said modes of operation and thereby causing said suspension system to operate in different modes, the damping provided by said damper means in each of said modes of operation of said system being different from the damping produced by said damper means in other of said modes of operation of said system, said system receiving disturbance input and producing output, said apparatus comprising:

monitoring means for monitoring conditions of operation of said suspension system and for producing data indicative thereof;

system modeling observer means for modeling said different modes of said system, and for receiving data from said monitoring means, and for generating real time estimates of the output that would be produced by said system in



each of said modes thereof modeled by said observer means;

function means for comparing said estimates generated by said means with each other and for identifying an optimum one of said estimates;

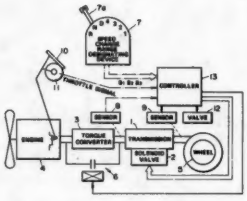
and control means for causing said damper means to operate in said system in the one of said modes thereof corresponding to the one of said modes thereof in the one of said modeled system modes producing said optimum one of said estimates.

4,881,173

ELECTRONICALLY CONTROLLED AUTOMATIC SPEED CHANGING APPARATUS

Takeo Kato; Shingo Kobayashi; Kazuo Takagi, all of Hiratsuka; Masahiro Watanabe, Yokohama, and Kiyoshi Kaneko, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 901,148
Claims priority, application Japan, Sep. 6, 1985, 60-197244
Int. Cl.[4] B60K *41/08*; G06F *15/20*
U.S. Cl. 364—431.07 **6 Claims**



1. An electronically controlled automatic speed changing apparatus comprising:

means for generating a speed stage change signal in accordance with a degree of throttle opening, engine speed and a predetermined speed change pattern;

actuator means for actuating a transmission in accordance with said speed stage change signal so as to change the speed stage of said transmission;

speed stage preselecting means for preselecting a desired speed stage of said transmission for a skipped speed stage change;

car speed detecting means for detecting car speed;

memory means for storing car speeds suitable for each speed stage of said transmission;

comparing means for comparing a current car speed detected by said car speed detecting means with the car speeds suitable for the desired speed stage; and

means for generating a skip speed stage change signal to instruct said actuator means to actuate said transmission so that the speed stage is skip-changed into said desired speed stage when said current car speed becomes less than the car speeds suitable for the desired speed stage.

4,881,174

SINUSOIDAL SIGNAL FREQUENCY MEASURING DEVICE

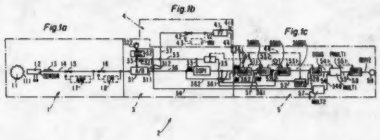
Helmut Gimmler, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,471

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721827

Int. Cl.[4] G01R *23/02*

U.S. Cl. 364—484 **11 Claims**



1. Device for measuring the frequency of a sinusoidal signal generated by a signal generator, said signal generator including a transmitter revolving with a shaft and having uniform divisions and a sensor, said device comprising:

oscillator means having a constant, but adjustable, sampling clock frequency higher than expected frequency of a sinusoidal signal;

analog to digital converter means, connected to said oscillator means, for receiving sinusoidal signals from said signal generator, sampling at a frequency determined by said sampling clock pulses and providing digital valves as a sign output and an absolute value output;

first digital memory means, connected to said oscillator means and analog to digital converter means, triggered by each sampling clock pulse from said oscillator means, for storing an absolute value formed during the preceding sampling clock pulse by said analog to digital converter means while said analog to digital converter means is providing a next digital value;

counter means, connected to said oscillator means, for counting sampling clock pulses until reset;

flip-flop means, connected to said analog to digital converter means, and triggered by a transition of said sign output from a first to a second sign, for providing a transition output pulse;

first adder means, connected to said first digital memory means, said analog to digital converter means and said flip-flop means, for adding the absolute value of the digital value of said second sign, which triggered said flip-flop means, from said analog to digital converter means to the presently absolute digital value of said first sign from said first digital memory means and providing a first sum output signal in response to said transition output pulse;

first divider means, connected to said first adder means, and said first digital storage means, for forming the quotient of the absolute digital value of said first sign from said first digital memory means and the first sum output signal and providing a first quotient signal in response to a first adder completion signal;

second adder means, connected to said first divider means and said counter means, for adding the present count and the first quotient signal and providing a reset signal to said counter means and a second sum output signal in response to a first quotient completion signal;

second digital storage means, connected to first divider means and said flip-flop means and triggered by said transition output pulse, for storing a first quotient signal, formed in response to a previous transition output pulse while said first divider is forming a present quotient;

subtractor means connected to second adder means and said second digital storage means for forming the difference of the second sum output signal from said second adder means and said first quotient signal of a previous transition output signal from said second digital storage means and providing a different output signal in response to said reset signal; and

first multiplier means, connected to said subtractor means and having a signal-generator-specific product input, for forming product of said difference output signal and a signal-generator specific-product signal and providing a frequency output signal for a period between transition output pulses in response to a subtraction completion signal.

4,881,175

COMPUTER BASED SYSTEM AND METHOD FOR DETERMINING AND DISPLAYING POSSIBLE CHEMICAL STRUCTURES FOR CONVERTING DOUBLE- OR MULTIPLE-CHAIN POLYPEPTIDES TO SINGLE-CHAIN POLYPEPTIDES

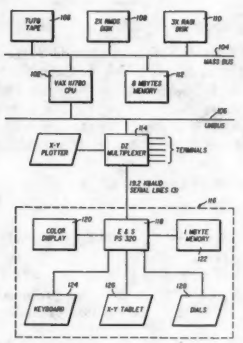
Robert C. Ladner, Iamsville, Md., assignor to Genex Corporation, Gaithersburg, Md.

Continuation of Ser. No. 115,919, Nov. 2, 1987, abandoned, which is a continuation of Ser. No. 902,970, Sep. 2, 1986, Pat. No. 4,704,692. This application Jun. 9, 1988, Ser. No. 204,940

The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.

Int. Cl.[4] G06F *15/46*; G01N *33/00*

U.S. Cl. 364—496 **3 Claims**



1. A computer based method, comprising the steps of:

(a) providing a first polypeptide and a second polypeptide;

(b) selecting, using computer methods, a first site on said first polypeptide, and a second site on said second polypeptide which are possible joining locations for a linker;

(c) selecting possible linkers, using computer methods, for bridging from said first polypeptide at said first site to said second polypeptide at said second site; and

(d) visually displaying, using computer graphics, computer-designed protein molecules, each comprising a portion of said first polypeptide, a portion of said second polypeptide, and one of said possible linkers selected by said step (c).

4,881,176
FILTER ANALYZING SYSTEM

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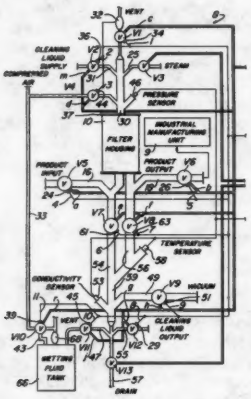
Filed Jan. 22, 1988, Ser. No. 147,331
Int. Cl.[4] G06F *15/46;* G01M *3/20*
U.S. Cl. 364—500 28 Claims



1. A filter apparatus to purify a gas or liquid for use in an industrial means comprising:

(a) a filter means for housing a filter integrally connected with said industrial means;

(b) means connected to said filter means for automatically testing said filter in situ by integrity testing in-place, sterilizing in-place and cleaning in-place; and

(c) means for controlling said in-place means singly, in combination or in totality.

4,881,177
ULTRASONIC SCANNING SYSTEM

James H. McClean, Belfast; Neil A. Campbell, County Down, and Iain M. Reid, Belfast, all of Northern Ireland, assignors to Short Brothers PLC, Belfast, Northern Ireland

PCT No. PCT/GB85/00405, § 371 Date Apr. 28, 1986, § 102(e) Date Apr. 28, 1986, PCT Pub. No. WO86/01897, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 9, 1985, Ser. No. 863,413
Claims priority, application United Kingdom, Sep. 12, 1984, 8423023
Int. Cl.[4] G01B *7/34*
U.S. Cl. 364—513 13 Claims

1. A method of performing a non-destructive testing operation on a workpiece, wherein a testing probe is used to scan a surface of the workpiece, the method being characterized by the steps of:

i. mounting the probe on the working end of an arm of an identical robot having a controller;

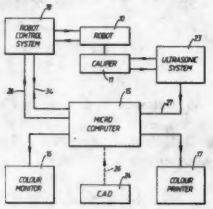
ii. mounting the workpiece adjacent the robot in a jig so that its position relative to the robot is determined;

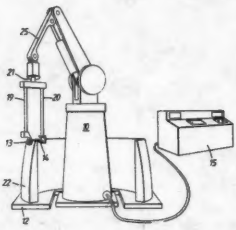
iii. providing the controller of the robot with such design data relating to the shape of the workpiece as will enable the robot to move the probe over the surface of the workpiece;

iv. programming the controller to command the robot to move the probe in a scanning path across the surface of the workpiece from a start point to a stop point, through a plurality of continue points, at a predetermined velocity;

v. inputting a computer with test data relating to the shape of the workpiece, the location of the start point on the surface of the workpiece, the predetermined velocity of probe movement, the instant of departure of the probe from the start point along the scanning path, and a signal representative of the output from the probe; and

vi. running a quality mapping program on the computer, for processing said test data to compute based solely upon said start point, said predetermined velocity, and said



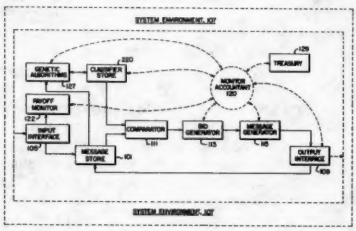


instant of departure without any feedback of position data the position of the probe on the surface of the workpiece which displays the position on the surface of the workpiece of zones of different quality within the material from which the workpiece is formed.

4,881,178
METHOD OF CONTROLLING A CLASSIFIER SYSTEM

John H. Holland, and Arthur W. Burks, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed May 7, 1987, Ser. No. 47,724
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—513 26 Claims



1. An adaptive computing system comprising, in combination,

a message memory for storing a plurality of messages, each message being represented by a sequence of binary digits;

a classifier memory for storing a plurality of classifiers, each such classifier consisting of

a condition part identifying a subset of messages in said

message memory which are to be translated into result messages,

an action part which specifies the functional relationship between the messages in said subset and said result messages, and

a strength value;

processing means for producing the result messages specified by each of said classifiers, said processing means further including

bid generating means for producing a bid value for each given one of said classifiers which produces at least one of said result messages, said bid value being related to the strength value of said given classifier and being further related to the strength values of those classifiers which produced the messages in the subset specified by the condition part of said given classifier, and

selection means responsive to said bid value for placing the result messages specified by only chosen ones of said classifiers in said message memory for further processing.

4,881,179

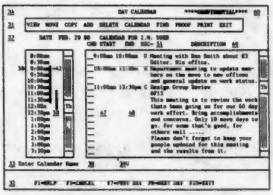
METHOD FOR PROVIDING INFORMATION SECURITY PROTOCOLS TO AN ELECTRONIC CALENDAR

James P. Vincent, Arlington, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 11, 1988, Ser. No. 166,572

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—518 **10 Claims**



1. A method for controlling the security of sensitive information entered into an individual electronic calendar by a user of an interactive information handling system having a display device and a keyboard when a day-calendar portion of said calendar containing a plurality of calendared events is displayed, said method comprising the following combination of sequential steps,

(A) entering one of a plurality of pre-established security classifications into said system at the time that each said event is being calendared,

(B) automatically developing a security label whenever said day-calendar portion is displayed, said label reflecting the highest security classification assigned to said plurality of events entered on said day-calendar portion, and

(C) displaying said security label with said day-calendar portion when said portion is displayed.

4,881,180

CHARACTER IMAGE GENERATING CIRCUIT

Masaaki Nishiyama, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1987, Ser. No. 21,456

Claims priority, application Japan, Mar. 5, 1986, 61-49059

Int. Cl.[4] G01D *15/06*

U.S. Cl. 364—518 **2 Claims**

2. A method for converting character code data to character image data of a dot pattern of specific character figures to be printed and for applying the character image data to a printer, comprising the steps of:

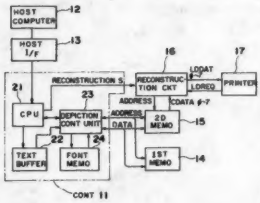
storing the character code data of one page in a first storing means;

converting a portion of said character code data in said first storing means to the character image data of the dot pattern corresponding to a section of one page to be printed;

storing said character image data corresponding to said section of one page in a second storing means;

compressing said character image data in second storing means and producing compressed character image data;

storing said compressed character image data in a third storing means;



repeating said converting step, said character image data storing step, said compressing step and said compressed character image data storing step until the compressed character image data corresponding to one page is stored in said third storing means; and

reconstructing said compressed character image data in said third storing means back to original character image data and applying reconstructed character image data to the printer.

4,881,181

PROCESS FOR THE DETERMINATION OF CONTROLLED VARIABLES FOR THE INKING UNIT OF PRINTING PRESSES

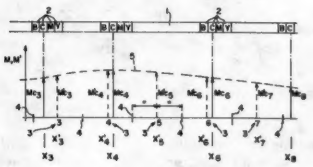
Willi Jeschke, Heidelberg, and Gerhard Löffler, Walldorf, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 136,210

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643720

Int. Cl.[4] B41F *31/04*

U.S. Cl. 364—519 **21 Claims**



1. A process for controlling the application of at least one ink in a printing press, said printing press having a plurality of ink metering ducts arranged laterally with respect to said printing press, each of said plurality of ink metering ducts substantially defining an ink zone of said printing press, each of said ink zones having a coordinate X'_i representing the lateral position of its center point with respect to said printing press, said process comprising the steps of:

(a) producing a print control strip with said printing press, said print control strip having printed thereon, by said printing press, a plurality of measurement fields of said at least one ink, each of said measurement fields having a

coordinate X_i representing its lateral position with respect to said printing press;

(b) analyzing said plurality of measurement fields produced on said print control strip to obtain a plurality of color related values M_i, each color related value M_i being indicative of the application of said at least one ink within said printing press at each of said lateral positions X_i;

(c) fitting a mathematical curve to said measured values X_i and M_i;

(d) determining values M'_i of said mathematical curve at said coordinates X'_i representing the lateral positions of said ink zones with respect to said printing press; and

(e) adjusting said ink metering ducts in accordance with said determined values M'_i.

4,881,182

METHOD FOR CONTROLLING INK DENSITY

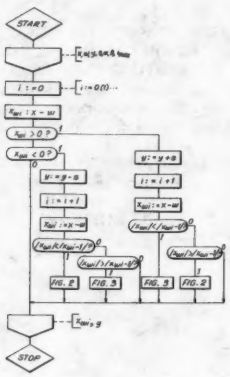
Dietrich Hank, and Peter Brüggemann, both of Leipzig, Fed. Rep. of Germany, assignors to VEB Kombinat Polygraph, "Werner Lamberz", Leipzig, Leipzig, Fed. Rep. of Germany

Filed Jul. 29, 1987, Ser. No. 79,632

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 2962177

Int. Cl.[4] G01B *11/14*; G06F *15/626*

U.S. Cl. 364—519 **3 Claims**



1. A method for controlling ink density in a printing process in a rotary printing machine for offset printing, wherein ink density control strips are printed during the printing process, comprising the steps of periodically scanning the control strips to determine control deviations of respective ink densities from reference values; alternately applying the measured control deviations for controlling the dosing of moisture agent amounts and of printing ink amounts, beginning with the dosing of a moisture agent amount; adjusting the dosing of the moisture agent amounts in a searching process including at least one sequence of adjustment steps for providing an increased or reduced supply of uniform amounts of the moisture agent, and limiting the sequence to a given maximal number of adjustment steps in the direction of increased or reduced supply.

4,881,183

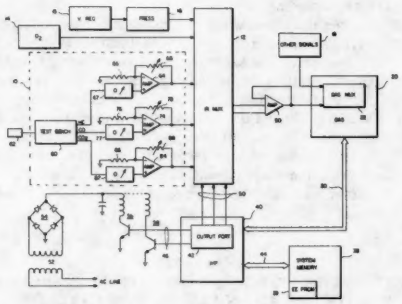
METHOD AND APPARATUS FOR EMISSION TESTING

David E. Groe, Oakwood Hills, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.

Filed Mar. 25, 1988, Ser. No. 173,419

Int. Cl.[4] G01N *21/00*; G06F *15/20*

U.S. Cl. 364—550 **2 Claims**



1. An emissions tester comprising:

means for calibrating said tester with a test sample having a known concentration of a particular gas;

means for storing pressure data for said test sample in a non volatile memory;

means for developing an analog voltage signal representative of the concentration of said particular gas in an exhaust emission;

an analog to digital converter for converting said analog voltage signal into a digital value, the range of said analog to digital converter being greater than the span of said analog voltage;

means for offsetting said analog voltage to substantially center it within the range of said analog to digital converter;

means for storing data, related to the amount of voltage offset, in a non-volatile memory;

means for correcting said analog voltage signal by said stored offset data;

means for sensing the pressure of said exhaust emission;

means for compensating said analog voltage signal based upon the difference in the sensed pressure and the stored pressure;

means for storing a gain factor in a non-volatile memory for relating said calibration voltage to a desired voltage; and

means for adjusting said analog voltage signal by said stored gain factor.

4,881,184

TURBINE MONITORING APPARATUS

Frank Abegg, III, and Stephen G. Gemmell, both of Fairbanks, Ak., assignors to Datac, Inc., Fairbanks, Ak.

Filed Sep. 8, 1987, Ser. No. 94,563

Int. Cl.[4] G01L *25/00*

U.S. Cl. 364—551.01 **8 Claims**

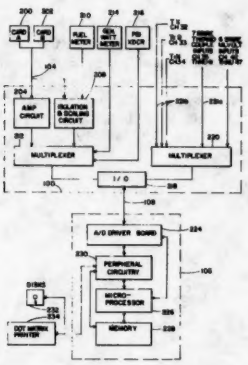
1. Apparatus for monitoring operating conditions of turbines wherein the turbine includes an electronic control panel which provides a plurality of operation signals each signal being indicative of the status of a turbine parameter, said apparatus comprising:

a cable selectively coupleable to the turbine control panel during a test period for receiving the operation signals therefrom;

interface means selectively coupleable to said cable during a test period for receiving the operation signals, said interface means being adapted to scale the operation signals such that they vary within a predetermined voltage range,

said interface means including an input/output (I/O) terminal; and

data processing means selectively coupleable to said I/O terminal during a test period for receiving the scaled



operation signals, said processing means being adapted to process the received scaled operation signals to provide user data indicating the operation conditions of the gas turbine, said processing means including memory for storing the user data.

4,881,185

METHOD OF MEASURING TEMPERATURE AND APPARATUS FOR EFFECTING THE METHOD

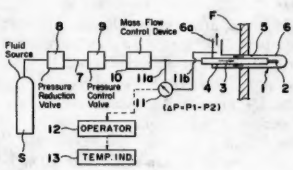
Koji Murakami, Settsu; Kazuya Higeta, Osaka, and Hachiro Touchi, Higashiosaka, all of Japan, assignors to Chugai Ro. Co., Ltd., Osaka, Japan

Filed Mar. 27, 1987, Ser. No. 30,606

Claims priority, application Japan, Apr. 1, 1986, 61-76023; Jul. 3, 1986, 61-157697; Dec. 27, 1986, 61-309926; Dec. 27, 1986, 61-309927

Int. Cl.[4] G01K *13/00;* **G01F** *1/34*

U.S. Cl. 364—557 **7 Claims**



1. A fluidic resistance type temperature measuring apparatus for measuring a temperature, comprising:

a source of a working fluid;

temperature-sensitive means for providing a pressure drop for said working fluid;

said temperature-sensitive means including,

an external cylinder closed at one of its end,

an internal cylinder disposed inside said external cylinder, and

a capillary tube positioned at a forward end of said internal tube,

said capillary tube and said external cylinder having a structural relationship such that said pressure drop is generated across said capillary tube;

a supply tube for introducing said working fluid from said source into said internal cylinder;

pressure control means, disposed in series with said supply tube, for controlling said working fluid pressure;

mass flow control means, disposed in series with said supply tube and said pressure control means, for controlling said working fluid's mass flow rate;

differential pressure gauge means, operatively connected to said temperature-sensitive means, for detecting said pressure drop across said capillary tube and for providing an output signal corresponding to said pressure drop; and

temperature determining means, operatively connected to said differential pressure gauge means, for determining the temperature in accordance with said output signal from said differential pressure gauge means.

4,881,186

APPARATUS FOR MEASURING INJECTION SPEED OF DIE CAST MACHINES

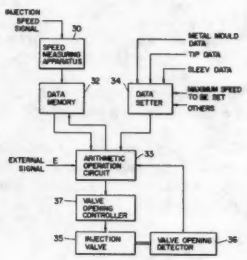
Hiroyuki Tsuboi, and Hiroshi Sugiyama, both of Zama, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 782,980, Oct. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 467,937, Feb. 18, 1983, abandoned. This application Jun. 14, 1988, Ser. No. 208,838

Claims priority, application Japan, Feb. 23, 1982, 57-26876; Feb. 23, 1982, 57-26874; Feb. 23, 1983, 57-26873

Int. Cl.[4] B22D *17/32;* **G01P** *3/48;* **G06F** *15/46*

U.S. Cl. 364—565 **1 Claim**



1. Apparatus for measuring an injection speed of a die cast machine comprising:

pulse generating means responsive to a movement of an injection plunger over a unit length for generating a pulse signal;

detecting means provided with a clock pulse generator for detecting a width of said pulse signal according to a number of said clock pulses generated in a time interval corresponding to said width of said pulse signal;

first memory means having N (an integer) memory areas each successively storing the number (PSi) of said clock pulses corresponding to each unit length over an interval between commencement and termination of injection in one stroke of said injection plunger;

an arithmetic operation unit for figuring out a maximum average injection speed, said arithmetic operation unit including:

second memory means for storing a sum of the clock pulses corresponding to consecutive K (an integer) unit lengths in said first memory means;

means for calculating a first sum

$$\left(\sum_{i=1}^{i=K} PSi\right)$$

of pulses stored in successive memory areas of 1 to K (where $K<N$) of said first memory means;

means for storing said first sum in said second memory means;

means for calculating a second sum

$$\left(\sum_{i=2}^{K+1} PSi\right)$$

of the numbers of clock pulses respectively stored in the memory areas 2 to K+1 of said first memory means;

means for subtracting said second sum from said first sum and for replacing the content of said second memory means with second sum

$$\left(\sum_{i=2}^{K+1} PSi\right)$$

when a result of said subtraction is positive; and

means for repeating said subtraction operation by sequentially incrementing suffix i by one until the suffix reaches N;

data setting means (34) for setting a desired maximum injection speed;

means for applying data stored in a data memory means (32) and data set by said data setting means to said arithmetic operation unit (33);

a value opening detector (36) for correcting a degree of opening of a hydraulic valve relative to a desired degree of injection valve opening;

means for feeding back a signal representing the degree of opening of said valve to said arithmetic operation unit; and wherein:

said maximum average injection speed at each K unit length is given by a sum remaining said second memory means; and

said arithmetic operation unit includes means for calculating a difference between said desired maximum injection speed set by said data setting means and a calculated maximum injection speed.

4,881,187

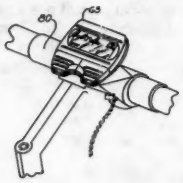
CYCLE COMPUTER WITH IMPROVED SWITCH AND PUSH-BUTTON ARRANGEMENT TO FACILITATE RESETTING

Robert Read, Bartlett, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Continuation of Ser. No. 160,406, Feb. 25, 1988, abandoned. This application Apr. 27, 1989, Ser. No. 346,337

Int. Cl.[4] G01P *3/48, 3/54;* **G01C** *22/00*

U.S. Cl. 364—565 **3 Claims**



3. In a cycle computer having a casing, an improved multiple switch control for a circuit within said casing comprising a pair of separate and independently movable manually depressible push-buttons located in side-by-side relation abutting one another along a common line, the surfaces of said push-buttons having adjacent recess portions constituting a single shared recess straddling said common line enabling adjacent surfaces of said push-buttons to be located by feel alone to facilitate simultaneous depression of both push-buttons, said push-buttons being respectively operatively connected to a pair of control switches for said circuit and being manually depressible simultaneously by single finger actuation applied to said shared recess to actuate said pair of control switches simultaneously.

4,881,188

BINARY CODING CIRCUIT

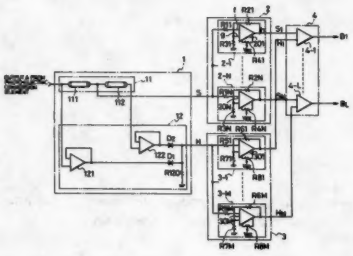
Naoki Maeda, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 25, 1987, Ser. No. 125,680

Claims priority, application Japan, Nov. 27, 1986, 61-285337

Int. Cl.[4] G06F *7/56*

U.S. Cl. 364—713 **3 Claims**



1. A binary coding circuit for binary coding an output of a photoelectric conversion element in an optical character reading unit which optically reads characters, said coding circuit comprising:

a parent signal generating circuit receiving an output of said photoelectric conversion element and generating a binary coding parent signal and a threshold parent signal;

a binary coding signal amplifier circuit group to which said binary coding parent signal is applied, said binary coding signal amplifier circuit comprising N amplifier circuits, where N is a positive integer, having different amplification factors and different offset levels;

a threshold signal amplifier circuit group to which said threshold parent signal is applied, said threshold signal amplifier circuit group comprising M amplifier circuits, where M is a positive integer, having different amplification factors and different offset levels; and

a comparison circuit group comprising L comparison circuits, where L is a positive integer satisfying MAX (M, N)$\leqq$L$\leqq$MN, in each of which an output of a respective one of said amplifier circuits in said binary coding signal, amplifier circuit group and a respective one of the outputs of said amplifier circuits in said threshold signal amplifier circuit group are subjected to comparison to provide a binary coded signal.

4,881,189

COMPUTER ANALYTICAL PROGRAM PROCESS

Don R. Proctor, 2700 Carol Dr., Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 544,562, Oct. 24, 1983. This application Jul. 15, 1986, Ser. No. 885,667

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—715.05 **1 Claim**

1. A method of entering and retrieving a function input and output data in a device comprising a programmable computer under the control of an operating system and said function, without the use of conversion factors, universal constants or analytical operators, the method comprising:

storing a plurality of predetermined functions in a program storing means;

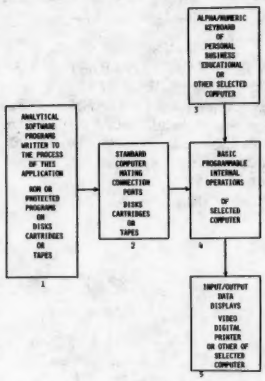
selecting, via an alphanumeric keyboard, one of said plurality of functions;

displaying the selected function on a video display;

querying the operator, through said video display, for the necessary input data;

entering, via said alphanumeric keyboard, input data in response to said queries, the input data having a data format comprising a numeric value and a unitfactor; said unitfactor being selected from a limited plurality of unit factor symbols as defined on said video screen of said device; said unitfactors and their symbols being those most applicable to the discipline of said selected function and independent to the symboling of the other predetermined functions;

said device converting said input data into a compatible internal data format, said internal data format having a numeric value and an unitfactor which is equivalent to said input data;


ANALYTICAL SOFTWARE PROGRAMS WRITTEN TO THE PROCESS OF THIS APPLICATION
ROM OR PROTECTED PROGRAMS ON DISKS CARTRIDGES OR TAPES
1
STANDARD COMPUTER MATING CONNECTION PORTS
DISKS CARTRIDGES OR TAPES
2
ALPHA/NUMERIC KEYBOARD OF PERSONAL BUSINESS EDUCATIONAL OR OTHER SELECTED COMPUTER
3
BASIC PROGRAMMABLE INTERNAL OPERATIONS OF SELECTED COMPUTER
4
INPUT/OUTPUT DATA DISPLAYS VIDEO DIGITAL PRINTER OR OTHER OF SELECTED COMPUTER
5

determining, va said device a result of the selected function, using data in said internal data format;

storing the result of the selected function in said internal data format;

querying the operator, through said video display, for a desired output data format;

selecting, via said alphanumeric keyboard, said desired output data format, said output data format having a numeric value and an unitfactor which is equivalent to said internal data format; said unitfactor being selected form a limited plurality of unitfactor symbols as defined on said video screen; said unitfactors and their symbols being those most applicable to the discipline of said selected function and independent to the symbology of the other said predetermined functions;

said device converting said internal data format into the equivalent output data format; and outputting the output data format onto an output means.

4,881,190

DIGITALLY PROGRAMMABLE SIGNAL GENERATOR AND METHOD

Gordon J. Priatko, Oakland, and Jeffrey A. Kaskey, San Leandro, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 2, 1986, Ser. No. 902,843
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—718 **10 Claims**

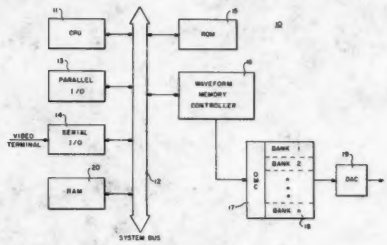
1. A digital waveform generator operating in successive time frames of a predetermined duration where each of said time frames has a plurality of clock cycles, said generator comprising:

first memory means for storing digital data in a plurality of addressable memory locations,

second memory means,

means for accessing some of said stored digital data and transporting said data into said second memory means,

said second memory means having parallel banks for storing digital data in a plurality of addressable memory locations, each of said parallel banks of said second memory means having a second access time within each of said time frames such that selected stored digital data is accessible after said second access time,



multiplexer means,

means for accessing some of said stored digital data during successive ones of said time frames yet after said second access time from said second memory means to said multiplexer means, said multiplexer means including

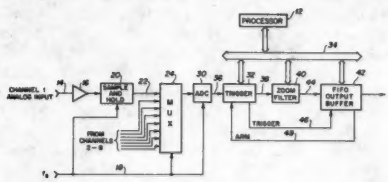
means for multiplexing within each of said time frames said stored digital data from second memory means within a third access time faster than both said first access time and said second access time to form a digital waveform having a data rate faster than the access time of said second memory means.

4,881,191

MULTICHANNEL DECIMATION/INTERPOLATION FILTER

Douglas W. Morton, Everett, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 13, 1987, Ser. No. 3,158
Int. Cl.[4] G06F *15/13*
U.S. Cl. 364—724.13 **15 Claims**



1. A digital, multichannel filter, comprising:

means for receiving digital channel input data comprising a sequence of time multiplexed samples from M channels, M being greater than one; and

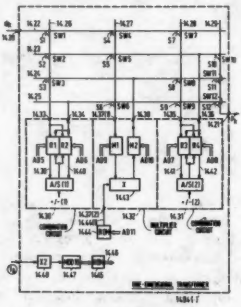
digital filter means for low pass filtering the channel input data from each channel to produce channel output data for each channel, said digital filter means further comprising N digital low pass filters for each channel, the low pass filters for each channel being numbered and ordered from 1 through N such that low pass filters n and n +1 are

serially connected for all n from 1 to N−1, each low pass filter comprising a plurality of state variables, the filter further including means for receiving pass input data and means for producing pass output data.

4,881,192
ONE-DIMENSIONAL LINEAR PICTURE TRANSFORMER

Roberto Woudsma; David C. H. Chong; Brian T. McSweeney; Stephanus M. C. Borgers, and Egidius A. P. Habraken, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1988, Ser. No. 178,952
Claims priority, application Netherlands, Apr. 10, 1987, 8700845
Int. Cl.[4] G06F *15/332*
U.S. Cl. 364—725 **6 Claims**



1. A one-dimensional transformer for multiplying a received series of N input words with a transform matrix of N×N predetermined transform elements for generating a series of N product words, which transformer is provided with:

an input bus connection **(14.20)** for receiving the input words;

an output bus connection **(14.21)** at which the product words occur;

a main input connection bus **(14.22)** which is connected to the input bus connection **(14.20)**;

a main output connection bus **(14.29)** which is connected to the output bus connection **(14.21)**;

a group of data connection buses **(14.23; 14.24; 14.25)**;

a number of combination circuits **(14.30, 14.31)** each having an input bus connection **(14.33; 14.35)** and an output bus connection **(14.34; 14.36)** and each adapted to add or subtract each time two data words received successively at its input bus connection for supplying result words to its output bus connection, the output bus connections of said combination circuits being connected to particular respective data connection buses **(14.23; 14.25)**;

a multiplier circuit **(14.32)** each having two input bus connections **(14.37(1); 14.37(2))** and an output bus connection **(14.38)**, the latter being connected to the remaining data connection bus **(14.24)** and the input bus connections being adapted to receive data words and multiplication factors, respectively, said multiplier circuit being adapted to multiply each received data word by an appropriate multiplication factor for generating an auxiliary product word at its output bus connection;

a multiplication factor memory **(14.44)** having addressable memory locations each adapted to store a multiplication factor, said multiplication factors being related to the transform elements and said memory being provided with a multiplication factor output bus **(14.44(1))** which is connected to one of the input bus connections **(14.37(2))** of the multiplier circuit;

a plurality of switching means (SW.) each controlled by associated control data (S.), each combination circuit and the multiplier circuit having associated there with one of said plurality of switching means, each switching means being adapted to connect selectively the input bus connection of the circuit with which they are associated at any instant to at most one of said connection buses which is not connected to the output bus connection of the relevant circuit;

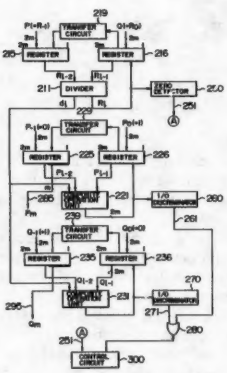
further switching means (SW10, SW11, SW12) which are controlled by further control data (S10, S11, S12) for connecting selectively the main output connection bus **(14.29)** at any instant) to at most one of the data connection buses **(14.23; 14.24; 14.25)**; and

a control memory **(14.45)** having a control bus **(14.46)** which is connected to the said switching means and which is adapted to store at least the said control data and to supply selectively said control data to the control bus.

4,881,193
RATIONAL NUMBER OPERATION UNIT FOR REDUCTION

Hozumi Hamada, Chofu, and Hiraku Nakano, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 84,330
Claims priority, application Japan, Sep. 4, 1986, 61-208649; Sep. 5, 1986, 61-209016
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—761 **10 Claims**



1. A rational number operation unit comprising:

divider means for sequentially calculating terms $d_1, d_2, \ldots$ or data $s_1, s_2, \ldots$ having a predetermined relation thereto of a continued fraction

$$d_1 + \cfrac{1}{d_2} + \cfrac{1}{d_3} + \cfrac{1}{d_4} + \cdots$$

for a rational number to be reduced, defined by a fraction comprising a numerator and a denominator,

said divider means including means for carrying out first division with said numerator as a dividend and said denominator as a divisor, outputting a quotient thereof as the first term d_1 or related data S_1, carrying out (i+1)th division for each of different positive integers i's starting from i=1 with a residue of i-th division as a divisor and the divisor of the i-th division as a dividend, and outputting a

quotient d_{i+1} or related data S_{i+1} as a result of the (i+1)th division;

calculation means connected to said divider means for calculating

$$P_i = P_{i-2} + d_i P_{i-1}$$

$$Q_i = Q_{i-2} + d_i Q_{i-1}$$

where P_i is a numerator and Q_i is a denominator of i-th approximate fraction to the rational number, based on the quotient d_i or data S_i and previously calculated numerator P_{i-2} and denominator Q_{i-2} of the (i−2)th approximate fraction and numerator P_{i-1} and denominator Q_{i-1} of the (i−1)th approximate fraction, each time the term di or related data S_i is calculated by said divider means; and

control means connected to said divider means so as to receive a residue of division carried out thereby each time said divider means carries out division for determining whether the residue of the division is zero or not, and when the residue is zero, outputting the numerator P_i and denominator Q_i of the i-th approximate fraction calculated by said calculation means as a reduced fraction of said rational number.

4,881,194

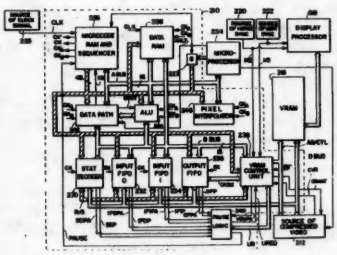
STORED-PROGRAM CONTROLLER FOR EQUALIZING CONDITIONAL BRANCH DELAYS

David L. Sprague, Hopewell, N.J.; Kevin Harney, Brooklyn, N.Y.; Allen H. Simon, Belle Mead, and Herbert H. Taylor, Jr., Hopewell Township, Mercer County, both of N.J., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 16, 1987, Ser. No. 121,820

Int. Cl.[4] G06F 9/00

U.S. Cl. 364—900 **6 Claims**



1. A data processing system comprising:

processing means responsive to control signals for processing data, including means for indicating values representative of a plurality of conditions;

a stored-program controller, coupled to said processing means including:

memory means for holding a plurality of instructions, wherein ones of instructions indicate conditional branch operations;

instruction decoding means for holding instructions provided by said memory means and providing said control signals for said processing means and control signals for said stored-program controller;

memory accessing means, responsive to control signals provided by said instruction decoding means for concurrently reading first and second instructions from said memory means; and

next instructions selection means responsive to control signals provided by said instruction decoding means and, when the instruction held in said instruction decoding means indicates a conditional branch operation, to said means for indicating the values of said plurality of conditions, for loading a selected one of said first and second instructions into said instruction decoding means.

4,881,195

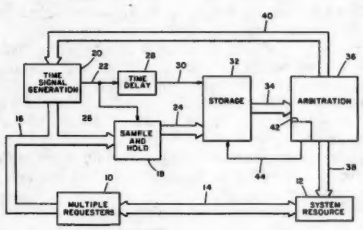
MULTI-REQUESTER ARBITRATION CIRCUIT

Steven T. DeLong, Bartlett, Ill., and James E. Snook, Plano, Tex., assignors to Rockwell International Corp., El Segundo, Calif.

Filed Nov. 26, 1986, Ser. No. 935,421

Int. Cl.[4] G06F 9/46, 13/18

U.S. Cl. 364—900 **7 Claims**



1. A multi-requester arbitration circuit for arbitrating between multiple asynchronous request signals requesting a common system resource comprising:

means for providing a first common timing signal from said request signals;

means for performing sample-and-hold on each of said request signals and producing corresponding output sample signals, said sample-and-hold means receiving said first common timing signal;

means for time delaying said first common timing signal to produce a second timing signal;

means for storing said output sample signals and producing corresponding output stored signals, said storing means receiving said second timing signal; and

means for arbitrating between said output stored signals to select one of said output stored signals and provide at least an output control signal having output enable signals corresponding to said output stored signals, and wherein said means for providing a first common timing signal receives said output enable signals, said means for arbitrating providing n number of output enable signals corresponding to an n number of request signals.

4,881,196

DATA TRANSMISSION LINE BRANCHING SYSTEM

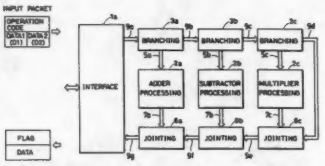
Hiroaki Terada, Suita; Katsuhiko Asada, Amagasaki; Hiroaki Nishikawa, Suita; Shinji Komori, Itami; Kenji Shima, Nishinomiya; Souichi Miyata; Satoshi Matsumoto, both of Nara; Hajime Asano, Toyonaka; Masahisa Shimizu, Kadoma, and Hiroki Miura, Hirakata, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo; Sharp Kabushiki Kaisha, Osaka; Matsushita Electric Industrial Co., Ltd., Kadoma and Sanyo Electric Co., Ltd., Moriguchi, all of, Japan

Filed Feb. 19, 1986, Ser. No. 830,750

Claims priority, application Japan, Feb. 19, 1985, 60-33036; May 17, 1985, 60-106672; May 17, 1985, 60-106669; May 17, 1985, 60-106670; May 17, 1985, 60-106671; Jun. 21, 1985, 60-136610; Jun. 21, 1985, 60-136608; Jun. 21, 1985, 60-136609; Jul. 5, 1985, 60-148597; Jul. 5, 1985, 60-148593; Jul. 5, 1985, 60-148594; Jul. 5, 1985, 60-148595; Jul. 5, 1985, 60-148596; Feb. 19, 1986, 60-33035

Int. Cl.[4] G06F *13/40*

U.S. Cl. 364—900 **31 Claims**



1. A data transmission system for transmitting data synchronously or asynchronously, comprising:

an input data transmission line for transmitting data and for holding the data;

an output data transmission line for outputting the data transmitted by said input data transmission line and for holding the data;

a branching data transmission line, having a branching end, for outputting branched data from the data transmitted by said input data transmission line and for holding the data;

branching decision means for deciding whether the data transmitted by said input data transmission line is to be branched;

empty branching end detecting means for detecting emptiness of data at the branching end of said branching data transmission line;

branching control means for controlling branching of the data transmitted by said input data transmission line to provide the data to said output data transmission line unless the data to be transmitted by said input data transmission line is to be branched to said branching data transmission line and for branching the data to produce branched data in response to the decision by said branching decision means, said branching control means comprising means for branching data to said branching data transmission line when said empty branching end detecting means detects the emptiness of data at the branching end of said branching data transmission line; and

data transfer means for providing connections between said input, output and branching data transmission lines, said branching decision means, said empty branching end detecting means and said branching control means.

4,881,197

DOCUMENT COMPOSITION SYSTEM USING NAMED FORMATS AND NAMED FONTS

Addison Fischer, P.O. Box 9107, Naples, Fla. 33942

Filed Feb. 13, 1987, Ser. No. 14,853

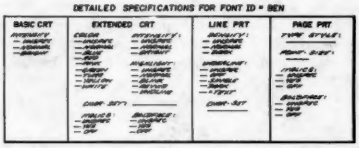
Int. Cl.[4] G06F *3/12, 3/14*

U.S. Cl. 364—900 **88 Claims**

39. In a data processing system for composing documents, said data processing system including means for entering data and commands relating to a document to be composed, data processor means for processing said data and executing commands, and at least one output means for presenting the document, said at least one output means including a first display device, a method for composing on a display device by a document composer a document comprising multiple lines of alphanumeric characters comprising the steps of:

a. assigning a first name to represent and be associated with data presentation characteristics for a predetermined portion of said document upon entry of said first name via said means for entering;

b. selecting by a document composer a first set of data presentation characteristics to be associated with a first field associated with said first name and defining the text character attributes used to produce the text characters appearing in said first field, said first field being associated with one part of said predetermined portion;



c. selecting by a document composer an independent second set of data presentation characteristics to be associated with a second field associated with said first name and defining the text character attributes used to produce the text characters appearing in said second field, said second field being associated with another part of said predetermined portion; and

d. responding to the entry of said first name by presenting the data in said one part of said predetermined portion with said first set of characteristics on the composer's display device and presenting the data in said other part of said predetermined portion with said second set of data presentation characteristics on the composer's display device, whereby the document composer may independently define a set of data presentation characteristics to be associated with each of a plurality of fields associated with said first name.

4,881,198

DUPLICATOR IN A MAGNETIC BUBBLE MEMORY AND PROCESS FOR DUPLICATING BUBBLES THEREIN

Jean-Marc Fedeli, St. Egréve, and Jöel Magnin, St. Martin d'Héres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 719,706, Apr. 4, 1985, abandoned. This application Mar. 6, 1989, Ser. No. 320,860

Claims priority, application France, Apr. 5, 1984, 84 05378

Int. Cl.[4] G11C *19/08, 11/42*

U.S. Cl. 365—12 **6 Claims**

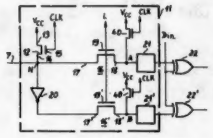
1. A duplicator in a magnetic bubble memory comprising a magnetic material layer in which magnetic bubbles can be displaced by the application of a rotary field H_T in accordance with first and second propagation paths, the first path being defined by a first group of non-implanted patterns aligned along a planar crystallographic axis for the easy magnetization of the magnetic material, the second path being defined by a second group of non-imparted patterns aligned along an axis positioned transversely with respect to the axis of the first group of patterns, wherein said duplicator comprises a bubble extension conductor, a bubble splitting conductor, means for generating an extension pulse coupled to said bubble extension conductor and means for generating a splitting pulse coupled to said bubble splitting conductor, the extension conductor being positioned between the end pattern of the first group of

patterns and the second group of patterns, the bubble splitting conductor being positioned transversely with respect to the bubble extension conductor between the two groups of patterns, the shape of the ends of the patterns of the first group of patterns forming bubble stable positions at the duplication location on each first propagation path at the said end and the shape of the second group of patterns forming bubble stable positions at the corresponding reception location of the duplicated bubble on the second propagation path, the extension pulse generating means applying an extension pulse to said bubble extension conductor and the splitting pulse generating means applying a splitting pulse to said bubble splitting conductor, said extension pulse starting before said splitting pulse and coinciding in time with the time during which the bubble to be duplicated is stationary in the duplication position, and said splitting pulse starting and ending before the end of the duration of said extension pulse.

4,881,199
READ CIRCUIT FOR READING THE STATE OF MEMORY CELLS

Jacek Kowalski, Trets, France, assignor to SGS-Thomson Microelectronics S.A., Paris, France

Filed Jan. 14, 1988, Ser. No. 143,717
Claims priority, application France, Jan. 16, 1987, 87 00449
Int. Cl.[4] G11C *7/00, 11/34;* **H03K** *19/096, 19/017*
U.S. Cl. 365—189.01 **7 Claims**



1. A read circuit for an array of addressable memory cells, wherein said cells have two possible complementary logic states and the state of an addressed cell is readable by detecting a current variation on a bit line to which said cell is connected during a read operation, said read circuit comprising a first precharge circuit for precharging said bit line to a first specified voltage level prior to a read operation, and a first detection circuit having an input connected during a read operation, and a first detection circuit having an input connected during a read operation to said precharged bit line, for detecting a current variation on said bit line, said current variation depending on the state of the addressed cell, said read circuit further comprising:

an isolation switch between said bit line and the input of said first detection circuit, said isolation switch rendered conductive only during a read operation;

a second detection circuit identical to said first mentioned detection circuit and having an input connected to said bit line through at least a second isolation switch, said second switch also rendered conductive only during a read operation,

a second precharge circuit connected to the input of said first mentioned detection circuit for precharging to a second specified voltage the input of said first detection circuit prior to a read operation,

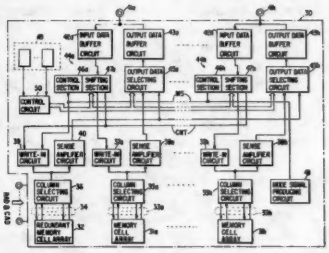
a third precharge circuit connected to the input of said second detection circuit, for precharging to a third specified voltage the input of said second detection circuit prior to a read operation;

said specified voltages being such that whatever the state of the addressed cell, one of the two detection circuits will detect a current variation corresponding to the actual state of the addressed cell and the other detection circuit will detect a current variation corresponding to a state which is complementary of this actual state.

4,881,200
ERASABLE PROGRAMMABLE READ ONLY MEMORY DEVICE

Takahiko Urai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,287
Claims priority, application Japan, Oct. 22, 1987, 62-267797
Int. Cl.[4] G11C *7/00, 8/00, 7/02*
U.S. Cl. 365—189.04 **9 Claims**



1. An erasable programmable read only memory device capable of being shifted into an operation selected from the group of a write-in mode of operation, a read-out mode of operation and a diagnostic mode of operation, comprising:

(a) a plurality of memory cell arrays each having a plurality of memory cells arranged in memory cell rows and memory cell columns, each of said memory cells being capable of memorizing a data bit in a rewritable and non-volatile manner;

(b) at least one redundant memory cell array having a plurality of redundant memory cells arranged in redundant memory cell rows and redundant memory cell columns, each of said memory cells being capable of memorizing a data bit in the rewritable and nonvolatile manner, said memory cell columns being replacable with said redundant memory cell columns, respectively;

(c) a plurality of first write-in circuits each provided in association with each of said memory cell arrays and operative to write a data bit into a memory cell selected from the memory cell array;

(d) at least one second write-in circuit provided in association with said redundant memory cell array and operative to write a data bit into a redundant memory cell selected from the redundant memory cell array;

(e) a plurality of first sense amplifier circuits each provided in association with each of said memory cell arrays and operative to quickly decide the logic level of said data bit read out from the memory cell selected from the memory cell array;

(f) at least one second sense amplifier circuit provided in association with said redundant memory cell array and operative to quickly decide the logic level of said data bit read out from the memory cell selected from the redundant memory cell array;

(g) a plurality of first column selecting circuits each provided in association with each of said memory cell arrays and operative to provide a data path between one of said memory cell columns selected from the memory cell array and one of each first write-in circuit and each first sense amplifier circuit depending upon the operation to which said erasable programmable read only memory device is shifted;

(h) at least one second column selecting circuit provided in

association with said redundant memory cell array and operative to provide a data path between one of said redundant memory cell columns selected from the redundant memory cell array and one of said second write-in circuit and said second sense amplifier circuit depending upon the operation to which said erasable programmable read only memory device is shifted;

(i) programmable link means operative to memorize a replacement between said memory cell columns and said redundant memory cell columns and providing a replacing information;

(j) a control circuit operative to compare the memory cell column selected from said memory cell columns with said memory cell column replaced with said redundant memory cell column on the basis of said replacing information and produce a multi-bit control signal if these memory cell columns are identical with each other;

(k) a plurality of input/output data buffer circuits each provided in association with each of said memory cell arrays and operative to temporally store the data bit read out from or written into the memory cell selected from said memory cell array;

(l) a plurality of output data selecting circuits each provided in association with each of said memory cell arrays and activated in said read-out mode of operation, each of said output data selecting circuits being operative to transfer the data bit read out from the memory cell selected from said memory cell array in the absence of said multi-bit control signal but transfer the data bit read out from the redundant memory cell selected from said redundant memory cell array in the presence of said multibit control signal;

(m) a plurality of input data distributing circuits each provided in association with each of said memory cell arrays and activated in said write-in mode of operation and said diagnostic mode of operation, each of said input data distributing circuits being operative to transfer the data bit stored in each input/output data buffer circuit to said first write-in circuit in the absence of said multi-bit control signal but transfer the data bit to the second write-in circuit when the erasable programmable read only memory device is shifted into the write-in mode of operation; and

(n) a mode signal producing circuit operative to produce a mode signal representative of said diagnostic mode of operation when said erasable programmable read only memory device is shifted into the diagnostic mode of operation, wherein at least one of said input data distributing circuits is responsive to the mode signal and transfer the data bit stored in said input/output data buffer circuit to both of said first and second write-in circuits.

4,881,201

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Nobuyuki Sato, Tokorozawa; Kazuaki Ujiie, Tokyo; Masaaki Terasawa, Akishima, and Shinji Nabetani, Tokyo, all of Japan, assignors to Hitachi, Ltd. & Hitachi Microcomputer Engineering, Ltd., Tokyo, Japan

Division of Ser. No. 737,882, May 28, 1989, Pat. No. 4,692,904. This application Jul. 28, 1987, Ser. No. 78,764

Claims priority, application Japan, May 25, 1984, 59-104629

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189.09 **6 Claims**

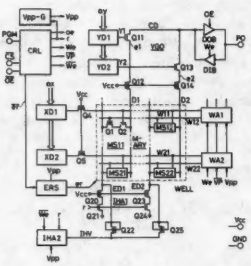
1. A semiconductor non-volatile memory used in a microcomputer including means for processing data comprising:

a memory circuit which includes a memory element for storing data, wherein a voltage equal to greater than a predetermined voltage level is required to be applied to said memory element in order to change the state of data stored in said memory element;

voltage generating means for forming an output voltage of a level different from that of a power source voltage, said output voltage being equal to or greater than the predetermined voltage level required to change the state of data stored in said memory element;

means for forming an internal control signal that changes from a first level to a second level when the data of said memory element is to be changed in response to a control signal;

control means coupled to said internal control signal forming means; and



writing means coupled to said memory circuit, to said voltage generating means and to said control means, said writing means including means for changing the state of data stored in said memory element in response to the second level of the applied internal control signal,

wherein said control means includes a power source closure detector circuit for forming an inhibiting signal which prevents an internal control signal being applied to said writing means from changing to the second level when said power source is closed.

4,881,202

SEMICONDUCTOR MEMORY DEVICE USING PARTIAL DECODERS FOR REDUNDANCY

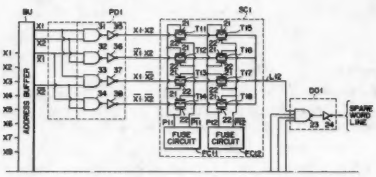
Jun-ichi Tsujimoto, Yokohama; Masataka Matsui, Tokyo; Hiroshi Iwai, Kawasaki, and Takayuki Ohtani, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 29, 1987, Ser. No. 138,800

Claims priority, application Japan, Jan. 6, 1987, 62-832

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—200 **6 Claims**



1. A semiconductor memory device including a plurality of cells subject to defects and having normal word lines and spare word lines connected to said cells, comprising:

an address buffer for receiving a plurality of bit signals forming an address signal, and generating bit signals of the original logic levels of the received bit signals and bit signals of the complementary logic levels of the received bit signals;

a plurality of first partial decoders, each for receiving and decoding a predetermined two of said bit signals of the original logic levels and two of said bit signals of the complementary logic levels corresponding to said predetermined two bit signals, and outputting different signal

combinations of said predetermined two bit signals and said two corresponding bit signals;

a plurality of spare word line selecting circuits, each for receiving said different signal combinations output from the corresponding one of said first partial decoders and selecting one of said different signal combinations; and

a second partial decoder for receiving the signal combinations selected by said spare word line selecting circuits and taking the logical product of the selected signal combinations to produce a logical product signal, in order to select a spare word line which corresponds to a normal word line to which a defective cell is connected.

4,881,203

SEMICONDUCTOR MEMORY DEVICE

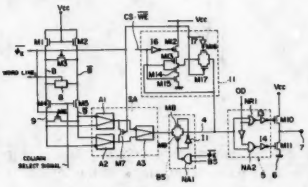
Kazuo Watanabe, and Akira Yumoto, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,511

Claims priority, application Japan, Mar. 17, 1987, 62-63340

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—203 **9 Claims**



1. A semiconductor memory device comprising:

a plurality of memory cell blocks;

each of said memory cell blocks having a plurality of memory cells, bit lines, and local data lines for reading out data stored in each of said memory cells;

a main data line connected to said local data lines; and

a precharge circuit connected to said main data line and not in series with the connection between said local data lines and said main data line, said precharge circuit serving to generate, immediately before producing a reading output, a medium-level voltage intermediate between and high and low levels of said main data line.

4,881,204

OPTICAL READING OR WRITING APPARATUS

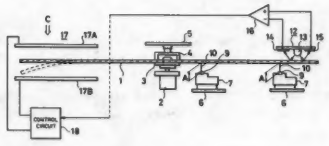
Michihiro Tadokoro; Hitoshi Imai, and Kazuo Okada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 185,052

Claims priority, application Japan, Apr. 28, 1987, 62-105866

Int. Cl.[4] G11B *7/08*

U.S. Cl. 369—46 **9 Claims**



1. An optical reading or writing apparatus comprising

an information-carrying medium on which information can be read or written optically, the information-carrying medium having the form of a disc rotating around a central axis and receiving a light beam from an optical head that is driven in the radial direction of the disc,

a detection means located near the information-carrying medium, for detecting the angle between the optic axis of the light beam and the surface of the information-carrying medium,

a temperature-adjusting element located near and facing the surface of the information-carrying medium, for creating a temperature difference between the two surfaces of the information-carrying medium and thereby causing a thermal deformation that bends the information-carrying medium in a desired direction, and

a control circuit for receiving a signal from the detection means and controlling the temperature-adjusting element by supplying energy to it in such a way as to maintain a perpendicular relationship between the surface of the information-carrying medium and the optic axis.

4,881,205

COMPACT ELECTRONIC APPARATUS WITH A REFRESH UNIT FOR A DYNAMIC TYPE MEMORY

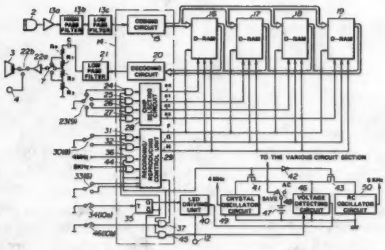
Toshiharu Aihara, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,444

Claims priority, application Japan, Apr. 21, 1987, 62-60166

Int. Cl.[4] G11C *7/00, 8/00*; G06F *1/00*

U.S. Cl. 365—222 **12 Claims**



1. A compact electronic apparatus having a refresh unit for a dynamic type memory, comprising:

a battery power source;

first oscillator means for generating a relatively high frequency signal;

second oscillator means for generating a relatively low frequency signal with respect to said high frequency signal;

a dynamic type memory required to be refreshed during a non-access time period;

first switch means coupled between said battery power source and said first oscillator means, for applying a battery voltage derived from said battery power source to said first oscillator means;

second switch means coupled between said battery power source and said second oscillator means, for applying the battery voltage obtained from said battery power source to said second oscillator means;

external operation switch means for starting an accessing operation of said dynamic type memory;

first output control means for actuating said first oscillator means, including means for applying said battery voltage to said first oscillator means when said first switch means is turned ON by operation of said external operation switch means, wherein said high frequency signal is generated;

memory access means for accessing said dynamic type mem-

ory in response to said high frequency signal derived from said first oscillator means; and

second output control means for turning OFF said first switch means during a non-accessing operation time period of said dynamic type memory and interrupting the oscillation of said first oscillator means, and for simultaneously turning ON said second switch means to actuate said second oscillator means, wherein said low frequency signal derived from said second oscillator means is output in the form of a refresh signal for said dynamic type memory.

4,881,206

MEMORY DEVICE

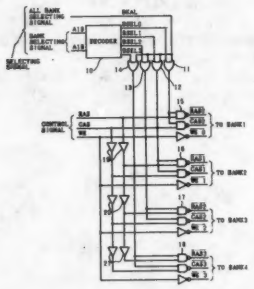
Takashi Kadono, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 137,234

Claims priority, application Japan, Dec. 26, 1986, 61-314268

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—227 **16 Claims**



13. A memory device having a plurality of bank memories to which common address lines and common data lines are respectively connected, and a bank-selecting means having a plurality of first circuits respectively connected to the bank memories, each first circuit comprising a gate whose input signals are a bank-selecting signal designating the corresponding bank memory and control signals needed for writing data into the corresponding bank memory or reading data from the same, said gate providing the corresponding bank memory with the control signals on receipt of the bank-selecting signal, said memory device comprising:

a second circuit connected to said first circuits for simultaneously delivering a signal substantially equivalent to said bank-selecting signal to all of said first circuits so as to cause the first circuits to deliver said control signals to all of said bank memories, and

one or more of said first circuits comprising a delay circuit which temporarily delays the delivery of said control signals to the corresponding bank memories so as to prevent the control signals from being supplied simultaneously to all of the bank memories.

4,881,207

SEISMIC PROSPECTION METHOD PROVIDING IMPROVED KNOWLEDGE OF THE GEOLOGICAL DISCONTINUITIES OF THE SUBSOIL

Michel Dubesset, Bazemont, and Christian Cliet, Rueil-Malmaison, both of France, assignors to Insitut Francais du Petrole, Rueil-Malmaison, France

Filed May 4, 1988, Ser. No. 190,152

Claims priority, application France, May 7, 1987, 87 06544

Int. Cl.[4] G01V *1/40, 1/30*

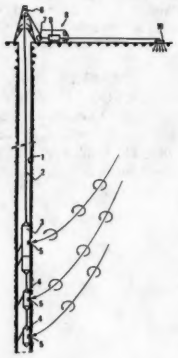
U.S. Cl. 367—31 **8 Claims**

1. A seismic prospection method for identifying the position and nature of geological discontinuities of the subsoil, including the steps of:

transmitting the acoustic waves into the ground;

receiving the acoustic waves which are propagated in the ground by means of a plurality of seismic triaxial receivers each having three sensors and recording the waves received;

determining, from the different signals delivered by each



said receiver, parameters defining the real position in space and the form of the ellipsoid modeling displacement of the center of gravity of each said receiver, in response to the waves received;

determining the variations of each of said parameters, as a function of the distance between each receiver and the transmission location; and

localizing geological discontinuities at depths where sensible concomitant variations of said parameters are measured.

4,881,208

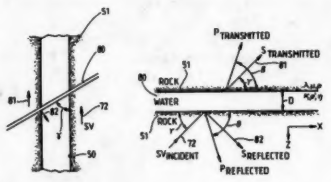
ACOUSTIC WELL LOGGING METHOD AND APPARATUS

Olive Y. Liu, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Division of Ser. No. 70,470, Jul. 27, 1987, Pat. No. 4,813,028. This application Oct. 27, 1988, Ser. No. 263,657

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—35 **1 Claim**



1. A method for determining the dip and orientation of a fracture or thin bed in a subsurface geological formation traversed by a borehole, comprising the steps of:

(a) passing a logging tool through the borehole, the logging tool having associated therewith a rare earth acoustic transducer;

(b) generating a known, low frequency acoustic energy at a point in the borehole with the rare earth acoustic transducer;

(c) while operating the rare earth acoustic transducer in a dipole mode at the point in the borehole, directing said known, low frequency acoustic energy into the subsurface

geological formation in two alternating directions, the directions being disposed substantially perpendicular to one another;

(d) receiving acoustic signals at a plurality of receiver stations spaced one from the other and from the rare earth acoustic transducer;

(e) simultaneously producing full shear waveforms of the received signals for the point in the borehole;

(f) determining the shear waveform reflection and transmission coefficients of the shear waveforms;

(g) measuring values of the amplitudes of the shear waveforms; and

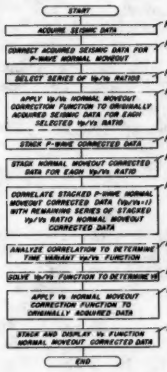
(h) combining the values of the shear waveforms amplitudes with the known value of the frequency of the acoustic energy to obtain the dip and orientation of the fracture or thin bed.

4,881,209

METHOD OF PROCESSING CONVERTED MODE SEISMIC DATA

Marvin G. Bloomquist, Lewisville, and Barry N. Warner, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 12, 1988, Ser. No. 256,674
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—52 **9 Claims**


START
ACQUIRE SEISMIC DATA
100
CORRECT ACQUIRED SEISMIC DATA FOR P-WAVE NORMAL MOVEOUT
105
SELECT SERIES OF Vp/Vs RATIOS
110
APPLY Vp/Vs NORMAL MOVEOUT CORRECTION FUNCTION TO ORIGINALLY ACQUIRED SEISMIC DATA FOR EACH SELECTED Vp/Vs RATIO
120
STACK P-WAVE CORRECTED DATA
125
STACK NORMAL MOVEOUT CORRECTED DATA FOR EACH Vp/Vs RATIO
130
CORRELATE STACKED P-WAVE NORMAL MOVEOUT CORRECTED DATA (Vp/Vs+1) WITH REMAINING SERIES OF STACKED Vp/Vs RATIO NORMAL MOVEOUT CORRECTED DATA
140
ANALYZE CORRELATION TO DETERMINE TIME VARIANT Vp/Vs FUNCTION
150
SOLVE Vp/Vs FUNCTION TO DETERMINE Vs
160
APPLY Vs NORMAL MOVEOUT CORRECTION FUNCTION TO ORIGINALLY ACQUIRED DATA
170
STACK AND DISPLAY Vs FUNCTION NORMAL MOVEOUT CORRECTED DATA
180
END

1. A method of correcting converted compressional to shear (P-SV) seismic data for t effects of normal moveout comprising the steps of:

(a) selecting a series of compressional wave velocity to shear wave velocity ratios

(b) determining the P-SV compressional to shear wave velocity ratios from said converted P-SV seismic data at said series of velocity ratios,

(c) applying a first normal moveout correction function dependent on said ratios to said converted P-SV seismic data for said series of ratios according to the following:

$$Tnmo = \sqrt{\left(\frac{x}{Vp} + \frac{k}{1+k}\right)^2 + T^2} + \sqrt{\left(\frac{x}{Vp} + \frac{k}{1+k}\right)^2 + (kT)^2}$$

where:

Tnmo=normal moveout corrected time;

Vp=average compressional wave velocity;

Vs=average shear wave velocity;

k=Vp/Vs;

x=source-receiver separation; and

T=compressional wave travel time;

(d) determining shear velocity from said applied P-SV seismic data; and

(e) applying a second normal moveout correction function to both compressional wave velocity and shear wave velocity according to the following:

$$Tnmo = \sqrt{\frac{Xp^2}{Vp^2} + Tp^2} + \sqrt{\frac{Xs^2}{Vs^2} + Ts^2}$$

where:

Tnmo=normal moveout travel time;

Vp=average compressional wave velocity;

Vs=average shear wave velocity;

Xp=source--CMP offset;

Xs=CMP--receiver offset;

Tp=compressional wave travel time; and

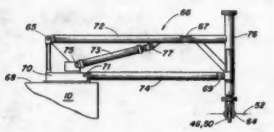
Ts=shear wave travel time.

4,881,210

TORSIONALLY RIGID SUPPORT APPARATUS FOR MARINE SEISMIC TRANSDUCER

Wilbur J. Myers, Davis, and Jack H. Cole, Ponca City, both of Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 16, 1988, Ser. No. 155,782
Int. Cl.[4] H04R *15/00*
U.S. Cl. 367—173 **18 Claims**



1. Apparatus for supporting a marine seismic transducer from a vessel, comprising:

an elongated substantially rigid towing arm;

a connector means for connecting said transducer to a lower end of said towing arm;

a swivel member which is secured to said vessel and is pivotable about a generally horizontal first axis transverse to a length of said vessel; and

a support means for pivotally connecting an upper end of said towing arm to said swivel member, said support means being pivotal relative to said swivel member about a second axis transverse to a longitudinal axis of said towing arm, said support means being substantially rigid so as to prevent any substantial rotation of said towing arm about its said longitudinal axis.

4,881,211

MULTIPLE FREQUENCY RANGE HYDRAULIC ACTUATOR

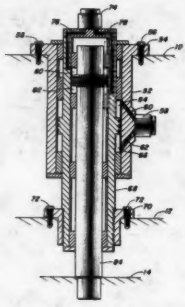
Wilbur J. Myers, Ft. Worth, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 31, 1988, Ser. No. 265,601
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—143 **3 Claims**

1. A compound hydraulic actuator for operating in two frequency ranges comprising:

a main cylinder housing means;

a low frequency piston means for providing low frequency, long stroke reciprocation within said main cylinder housing, said piston means having an internal opening configured to define a second cylinder; and



a high frequency piston means positioned within said second cylinder for providing high frequency, shorter stroke reciprocation.

4,881,212

ULTRASONIC TRANSDUCER

Yasuhito Takeuchi, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

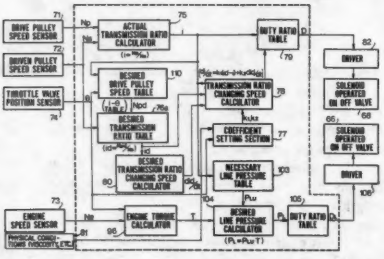
PCT No. PCT/JP87/00265, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO87/06790, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 24, 1987, Ser. No. 270,157

Claims priority, application Japan, Apr. 25, 1986, 61-96549

Int. Cl.[4] H04R *1/02*

U.S. Cl. 367—152 **5 Claims**



1. An ultrasonic transducer comprising an ultrasonic oscillator device and an acoustic impedance matching member useable in contact with an ultrasonic wave radiating surface, wherein said acoustic impedance matching member consists of

a plurality of layers, each layer being of a thickness less that one-fourth wavelength of an ultrasonic wave and consisting of a sublayer of plastic material and in contact therewith a sublayer of metallic material and arranged so that the sublayer of plastic material alternates with the sublayer of metallic material,

wherein the ratio of thickness of the sublayer of plastic material to the thickness of the sublayer of metallic material of each successive layer of the plurality of layers gradually changes from the said radiation surface to the oscillator device.

4,881,213

WATCH MOVEMENT HAVING DATE AND PHASES OF THE MOON INDICATORS

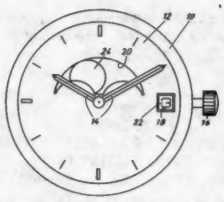
Abraham Zaslawsky, Neuchâtel, Switzerland, assignor to Eta sa Fabriques d'Ebauches, Switzerland

Filed Sep. 16, 1988, Ser. No. 245,182

Claims priority, application Switzerland, Sep. 24, 1987, 03692/87

Int. Cl.[4] G04B *19/26*

U.S. Cl. 368—15 **7 Claims**



1. A watch movement having indicators for the date and the phases of the moon, the date indicator having thirty-one teeth and that of the phases of the moon being integral with a wheel having fifty-nine teeth, an intermediate revolving wheel member driven in rotation by the watch movement at the rate of one revolution every twenty-four hours causing these indicators to advance by one step for each revolution, whereby at a predetermined angle of rotation of said intermediate revolving wheel member said wheel member is displaced in the direction of the teeth of the date indicator and whereby, at another predetermined angle of rotation of said intermediate revolving wheel member said wheel member is displaced in the direction of the wheel having fifty-nine teeth.

4,881,214

DATA RECORD FORMATTING SYSTEM AND READING/WRITING SYSTEM FOR OPTICAL RECORDING MEDIUM

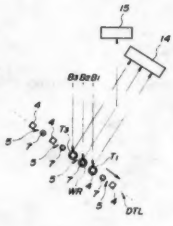
Shigeru Izawa, and Takashi Hasemi, both of Tokyo, Japan, assignors to CSK Corporation, Tokyo, Japan

Filed May 11, 1987, Ser. No. 48,573

Claims priority, application Japan, May 12, 1986, 61-108155; May 17, 1986, 61-113870; Jul. 8, 1986, 61-160444

Int. Cl.[4] G11B *7/013, 21/10*

U.S. Cl. 369—44 **12 Claims**



1. An optical recording medium containing a data record formatting arrangement adapted to carry out data reading and/or writing along tracking lines, said data record formatting arrangement comprising:

tracking portions used as a reference for the reading and/or writing operation; and

data recording portions for storing data;

said tracking portions and said data recording portions being

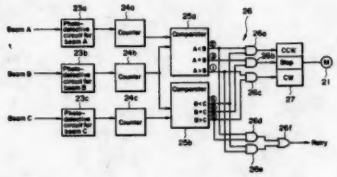
alternately arranged along the same line in a data recording region of the optical recording medium and wherein each of said tracking in the same line is formed square and has a length along one side of the tracking portion which is ½ the pitch or distance between any two adjacent tracking portions.

4,881,215

OPTICAL RECORDING MEDIUM AND METHOD FOR CORRECTING ANGULAR DEVIATION THEREOF

Kiyoshi Horie, Tokyo, Japan, assignor to Computer Services Corporation, Tokyo, Japan

Filed Nov. 25, 1986, Ser. No. 936,723
Claims priority, application Japan, Nov. 26, 1985, 60-265914
Int. Cl.[4] G06K *7/015*; G11B *7/09*
U.S. Cl. 369—44 **10 Claims**



1. A method for correcting an angular deviation of an optical recording medium, which comprises:

relatively moving the optical recording medium having a plurality of optically detectable strip patterns having a length and a width and formed on part of a substrate of the optical recording medium, in a direction across the width of the strip pattern, with respect to a pattern-detecting means;

detecting said strip patterns by said pattern-detecting means at a plurality of detecting points along the length of the strip patterns to count the number of the strip patterns passed through the respective detecting points according to the relative movement of the medium;

comparing the count values obtained at the respective detecting points to detect an angular deviation of the deviation; and

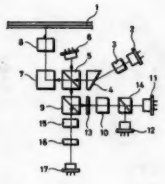
correcting said angular deviation of the optical recording medium on the basis of said angular deviation amount and said direction of the deviation.

4,881,216

OPTICAL HEAD IN AN OPTICAL MEMORY DEVICE

Toshihisa Deguchi; Yoshikazu Fujii; Tetsuya Inui, all of Nara; Kenji Ohta, Yao, and Schohichi Katoh, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 839,197, Mar. 13, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 237,652
Claims priority, application Japan, Mar. 13, 1985, 60-50788
Int. Cl.[4] G11B *7/00, 21/08, 21/10*
U.S. Cl. 369—54 **16 Claims**



1. An optical servo system for controlling the position of a light beam relative to an optical recording medium in an optical information retrieval system reading an optical information recording medium comprising:

a coherent light source emitting a coherent light beam;

a beam splitter, positioned between said source and the optical recording medium, said beam splitter allowing at least a major portion of the coherent light beam emitted by said coherent light source to be supplied to said optical recording medium and directing a reflected light beam from said recording medium along a first reflected path away from said coherent light source;

first optical detector means, disposed in said first reflected path, for monitoring a condition of said reflected light beam and generating at least one beam position output signal;

said beam splitter directing a portion of said coherent light emitted from said coherent light source along a second reflected light path different from said first reflected light path;

second optical detector means, disposed in said second reflected path, for receiving a portion of the light beam emitted from said light source and monitoring the intensity of the coherent light emitted from said light source and generating a source intensity signal;

circuit means responsive to said source intensity signal and said at least one beam position output signal for generating a servo error signal free of any offset caused by stray light beams incident on said first optical detection means; and

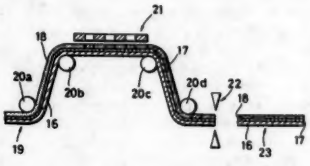
servo means for controlling the position of the light beam in response to said offset-free serve error signal.

4,881,217

METHOD OF MAKING OPTICALLY RECORDED INFORMATION MEDIUM BY EXPOSURE TO ULTRAVIOLET LIGHT

Hiroshi Ohki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP85/00393, § 371 Date Mar. 18, 1986, § 102(e) Date Mar. 18, 1986, PCT Pub. No. WO86/01020, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 12, 1985, Ser. No. 847,719
Claims priority, application Japan, Jul. 18, 1984, 59-149044
Int. Cl.[4] G11B *3/00*
U.S. Cl. 369—132 **6 Claims**



1. A method of making an optically recorded information medium, which comprises the steps of:

preparing an optical information recording medium consisting of a substrate, a light reflecting layer and a recording layer formed on the light reflecting layer for recording information according to the difference in optical density between exposed portions and non-exposed portions caused by selective exposure to ultraviolet rays;

exposing said recording layer to unfocused ultraviolet rays through a mask for exposure having a predetermined recording pattern, to form a continuous recording layer having portions of different optical density;

cutting the recording medium including the portion of the recording layer which has recorded the said information, to make an information stripe; and

fixing the information stripe on a supporting plate, whereby the difference in optical density between said exposed and

non-exposed portions form a visible indication of said information when viewed in light reflected from said light reflecting layer.

4,881,218

APPARATUS FOR ADAPTING THE DIAMETER OF A DISK-LIKE RECORDING MEDIUM

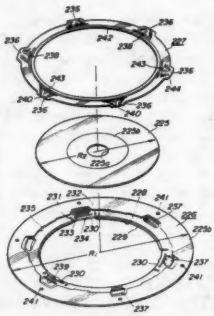
Eiji Yamamori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 162,203, Feb. 29, 1988, Pat. No. 4,839,784. This application Dec. 5, 1988, Ser. No. 280,212

Claims priority, application Japan, Mar. 14, 1987, 62-59668; Mar. 14, 1987, 62-59669; Mar. 14, 1987, 62-59670; Nov. 30, 1987, 62-302060

Int. Cl.[4] G11B *23/00, 25/04*

U.S. Cl. 369—289 **19 Claims**



1. An apparatus for adapting the diameter of a disk-like recording medium, comprising a holder having a diameter larger than that of the disk-like recording medium, said holder being formed so as to hold a non-signal record area on the outer periphery of the disk-like recording medium to allow signals recorded on the disk-like recording medium to be read out when the disk-like recording medium is held by said holder, and wherein said holder includes a supporting member for the disk-like recording medium which is shaped so that the disk-like recording medium is placeable thereon, said supporting member having an opening concentric with the disk-like recording medium placed thereon for exposing a signal record area of the disk-like recording medium, and clamping members for the disk-like recording medium removably mounted to said supporting member and including engaging means for engaging with mating engaging portions on said supporting member, said clamping members being mounted to said supporting member by engagement of said engaging means with said mating engaging means so as to clamp the disk-like recording medium in cooperation with said supporting member, said supporting member and said clamping members having respective thicknesses so that said holder has substantially the same thicknesses as said disk-like recording medium when said recording medium is clamped thereby.

4,881,219

CONTROL DEVICE FOR A SUNSHADE BLIND RESPONSIVE TO METEOROLOGICAL PHENOMENON

Dominique Jacquel, Marnaz, France, assignor to Somfy, France

Filed Mar. 30, 1984, Ser. No. 595,343

Claims priority, application France, Apr. 25, 1983, 8306754

Int. Cl.[4] F24J *3/02*

U.S. Cl. 364—400 **3 Claims**

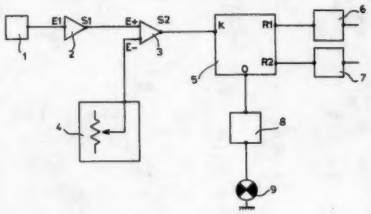
1. An automatic device for controlling a device for protection against meteorological phenomenon, such as a blind, comprising:

a sensor for measuring said meteorological phenomenon and generating a sensor signal responsive to the intensity of said phenomenon;

threshold regulating means for generating a presetable threshold signal;

a comparator coupled to said sensor and said threshold generating means for generating a comparator signal when said sensor signal exceeds said threshold signal, said comparator signal having a leading end corresponding to a first instance when said sensor signal exceeds said threshold signal and a trailing end corresponding to a second instance when said threshold signal exceeds said sensor signal;

an illuminating means for indicating a status of said device;



control means for activating said device in one of a first and a second direction, said control means including a first delay means for activating said device at the end of a first period after said leading end; and a second delay means for activating said device in a second direction at the end of a second period after said trailing end; and

illuminating control means for activating said illuminating means at the end of said first period if the trailing end does not occur before the end of said first period; said illuminating control means further being provided for activating said illuminating means intermittently during said second period if the illuminating means has been continuously activated; and for deactivating said illuminating means at the end of said second period.

4,881,220

MULTIPLEX COMMUNICATION SYSTEM FOR SEQUENCE CONTROLLERS

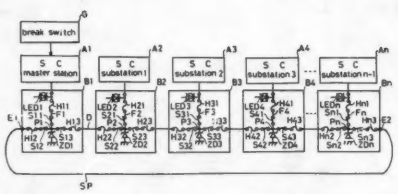
Toshihiko Yomogida, Kariya; Tsuyoshi Yamashita, Nagoya; Shigeo Yamamoto, Kariya; Hideaki Tobita; Hisanori Nakamura, both of Toyota, and Goro Kobayashi, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kiahsa, Toyota, both of, Japan

Filed Aug. 24, 1988, Ser. No. 235,498

Claims priority, application Japan, Aug. 24, 1987, 62-210859; Aug. 9, 1988, 63-198394

Int. Cl.[4] H04J *1/16, 3/14*

U.S. Cl. 370—16 **9 Claims**



1. A multiplex communication system for plural sequence controllers disposed in respective of plural stations and connected in sequence to a communication line, comprising:

plural first switches, each first switch disposed on a branch line which connects a sequence controller of a respective station to said communication line;

plural second switches and plural third switches, said second and third switches connected in series, with each of said second switches disposed on one side of a connecting point of a respective branch line of a respective sequence controller to said communication line and each of said third switches connected to the other side of the connecting point of the respective branch line of the respective sequence controller to said communication line; and

a spare line which connects in a loop the second switch of the respective sequence controller at one end of the sequence of sequence controllers with the third switch of the respective sequence controller at the other end of the sequence of sequence controllers thereby forming a line in parallel with the series connected second and third switches.

4,881,221

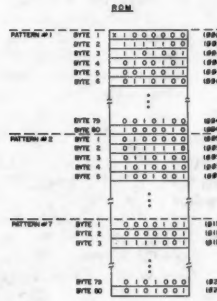
METHOD AND APPARATUS FOR DISABLING AN ECHO CANCELLER ON A DIGITAL TELECOMMUNICATIONS NETWORK

George L. Schroeder, Sherwood; Francis O. Couch, Portland, and Chamna Saenguraiporn, Aloha, all of Oreg., assignors to Kentrox Industries, Inc., Portland, Oreg.

Filed Jun. 23, 1988, Ser. No. 210,728

Int. Cl.[4] H04B *3/20*

U.S. Cl. 370—32.1 **11 Claims**



1. A telecommunications system comprising:

a bit-synchronous digital transmission circuit;

an echo canceller coupled to said transmission circuit, the echo canceller including disabling means for disabling operation of the echo canceller upon receipt of a predetermined command signal, said command signal comprising a sequence of digital data bits, the echo canceller including means for receiving said data bits in synchronous data frames defining command data bytes of fixed lengths; and

remote signalling means for transmitting the predetermined command signal to the disabling means, said remote signalling means comprising means for transmitting the digital data bits comprising the predetermined command signal repeatedly, each time with a different frame boundary so that one sequence of data bits will be framed into the data bytes that comprise the predetermined command signal.

4,881,222

MULTICARRIER DEMODULATOR

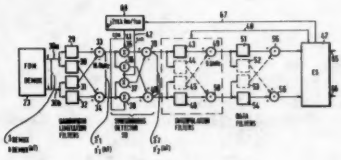
Heinz Goeckler, and Thomas Alberty, both of Backnang, Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,465

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707960

Int. Cl.[4] H04L *5/06, 27/00;* H04J *1/00*

U.S. Cl. 370—70 **3 Claims**



1. In a multicarrier demodulator for the separation and demodulation of a digitalized frequency multiplex signal into a plurality of individual channel signals comprising a frequency division demultiplexer for receiving and separating said digitalized frequency multiplex signal, a plurality of bandwidth limitation filters for filtering said individual separated channel signals, a synchronous demodulator for synchronously demodulating said individual separated and band-limited channel signals, a plurality of interpolation and Nyquist filters, and a decider circuit, wherein each of said individual separated and bandlimited channel signals is a complex signal and is fed to said synchronous demodulator.

4,881,223

ASYNCHRONOUS TIME DIVISION COMMUNICATION SYSTEM

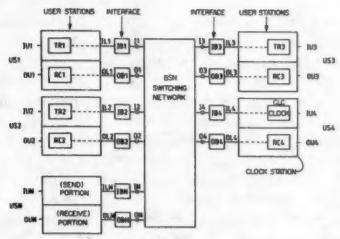
Pierre L. Debuysscher, Nazareth, Belgium, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 17, 1988, Ser. No. 169,867

Claims priority, application Belgium, Mar. 18, 1987, 8700280

Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—77 **9 Claims**



1. Asynchronous time division communication system comprising:

a switching network,

a first plurality of user stations, and

a corresponding first plurality of transmission links for coupling each of said user stations with said switching network whereby each of said user stations may transmit and receive asynchronous data to and from to any other of said user stations via said transmission links and said switching network,

wherein

at least some of said user stations each further comprise

clock extraction means to extract a clock signal from received asynchronous clock information data, and

at least one of said first plurality of user stations further comprises

means to generate said clock signal and

clock output means for generating said clock information from said clock signal and for selectivity transmitting said clock information as asynchronous data via said transmission links and said switching network to one or more of said at least some of said user stations.

4,881,224

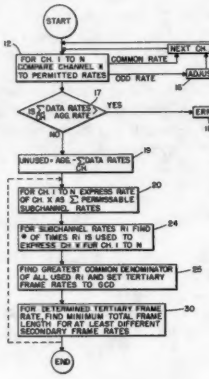
FRAMING ALGORITHM FOR BIT INTERLEAVED TIME DIVISION MULTIPLEXER

Kuldip S. Bains, Watertown, Conn., assignor to General Data-Comm, Inc., Middlebury, Conn.

Filed Oct. 19, 1988, Ser. No. 259,803

Int. Cl.[4] H04J 3/16

U.S. Cl. 370—82 **20 Claims**


START
NEXT CH
FOR CH. I TO N COMPARE CHANNEL N TO PERMITTED RATES
COMMON RATE
ODD RATE
ADJUST CH
YES
ERROR
NO
UNUSED = AGG. - Σ DATA RATES CH
FOR CH. I TO N EXPRESS RATE OF CH. X AS Σ PERMISSABLE SUBCHANNEL RATES
FOR SUBCHANNEL RATES Ri FIND # OF TIMES Ri IS USED TO EXPRESS CH X FOR CH. I TO N
FIND GREATEST COMMON DENOMINATOR OF ALL USED Ri AND SET TERTIARY FRAME RATES TO GCD
FOR DETERMINED TERTIARY FRAME RATE, FIND MINIMUM TOTAL FRAME LENGTH FOR AT LEAST DIFFERENT SECONDARY FRAME RATES
END

1. A method for determining optimal frame rates so that a plurality of channels are efficiently multiplexed onto a sub-aggregate of an aggregate line, comprising:

(a) obtaining data rates of said channels, and expressing each of said channel data rates as a sum of a plurality of predetermined subchannel dates rates;

(b) accumulating the number of times each predetermined subchannel date rate is used to express said channel data rates over said plurality of channels, wherein a greatest common denominator of said predetermined subchannel data rates having an accumulated positive number is chosen as a tertiary frame rate (T); and

(c) given a predetermined sub-aggergate rate (A) and said channel data rates expressed as a sum of a plurality of predetermined subchannel date rates, determining suitable primary (P) and secondary (S) frame rates by finding and minimizing for a plurality of primary and secondary frame rates a sum of

(1) A/P,

(2) (P/S)F1 where F1 represents a number of calls of a primary frame of frame rate P to a secondary frame of frame rate S, and

(3) (S/T)F2 where F2 represents a number of calls of said secondary frame of frame rate S to a tertiray frame of frame rate T.

4,881,225

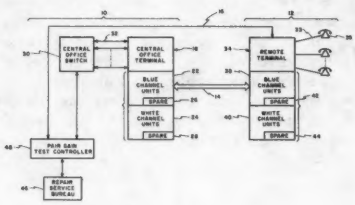
DIGITAL LOOP CARRIER SYSTEM HAVING MULTIPLEXED INTERRUPT STRUCTURE

Harry J. Dyke, Oak Forest, and Yoram Korn, Westmont, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 31, 1988, Ser. No. 239,141

Int. Cl.[4] H04J 3/16

U.S. Cl. 370—95.1 **15 Claims**



1. A system having a plurality of channel units for connection to a transmission line having a plurality of timeslots, said system having at least a central processing unit, comprising:

means for addressing oro providing a channel address via an address signal corresponding to a predetermined one of said plurality of timeslots to each of said channel units;

means for processing for assigning an assigned address to each channel unit of said plurality of channel units, each channel unit being assigned to a different selected timeslot of aid plurality of timeslots;

each of said channel units having means for comparing said channel address in said address signal to said assigned address, said channel unit upon having a correspondence between said channel address and said assigned address being an active channel unit;

means for providing a bus for connecting said plurality of channel units to said means for addressing; and

each of said channel units having interrupt means for signalling a means for interrupting in said means for addressing connected to said processing unit, thereby establishing a communication path between said active channel unit and said central processing unit.

4,881,226

DIGITAL INTERFACE OF AN INTEGRATED SUBSCRIBER LINE INTERFACE CIRCUIT

Robert Lechner, Sankt Poelten, Austria; Hans-Werner Rudolf, Munich, Fed. Rep. of Germany; Harald Stader, Munich, Fed. Rep. of Germany; Norbert Wingerath, Munich, Fed. Rep. of Germany; Christopher C. A. Priest, Maidenhead, United Kingdom; Nigel P. Dyer, London, United Kingdom; Robert K. P. Galpin, Cheshire, United Kingdom; Pierre Albouy, Lannion, France; Robert Le Gougnec, Lannion, France; Ramatchandirane Nadaradjane, Perros-Guirec, France; Marcello Manca, Milan, Italy; Virgilio Mosca, Milan, Italy, and Antonio Nicastro, Milan, Italy, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,429

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704408

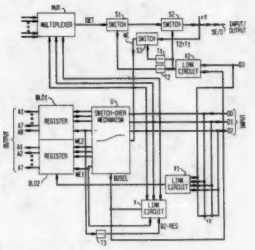
Int. Cl.[4] H04J 3/12

U.S. Cl. 370—110.1 **5 Claims**

1. A digital interface circuit for an integrated subscriber line interface circuit (SLIC) for the connection of analog subscriber lines of a digital time-multiplexed telecommunications network, over which the setting up of various operating conditions of the SLIC is effected and the query of the results of subscriber line status indications initiated in the SLIC occurs, said digital interface circuit comprising:

a parallel interface means having a plurality of input/output lines of which at least one of said lines is adapted to pro-

vide a signal entry operation for the subscriber line interface circuit as a signal input and a signal transmission operation for the subscriber line interface circuit as a data output, and additional lines adapted to provide input signal in both of said operating modes, whereby in signal entry operation said additional lines function as inputs for types of signals other than those types of signals present in signal transmission operation;



means for providing a group of lines adapted to receive input signals in both signal entry and signal transmission operating modes, including at least two registers, each of said registers having respective decoders coupled thereto, and further including a switch-over mechanism for the selective switching "on" of said registers and said associated decoders, whereby the possible binary values of the signals at the input lines to the group provides an increased number of operating instructions for the SLIC.

4,881,227

ARRANGEMENT FOR MONITORING A COMPUTER SYSTEM HAVING TWO PROCESSORS IN A MOTOR VEHICLE

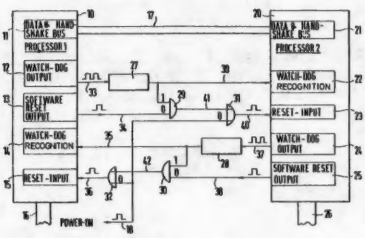
Harald Bühren, Bühl, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 29, 1987, Ser. No. 138,943

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700986

Int. Cl.[4] G06F *11/30, 15/16;* **F02D** *41/22*

U.S. Cl. 371—9 **4 Claims**



1. An arrangement for monitoring a computer system with two equal access processors in a motor vehicle, the arrangement comprising:

data and control lines interconnecting said two processors with each other;

means for operating said processors independently of each other except for a cyclical data and command exchange via said data and control lines;

each of said processors having a dedicated first output for supplying a dynamic watch-dog signal;

each of said processors having a dedicated first input for identifying a static watch-dog signal;

each of said processors having a dedicated second output for supplying a software-reset signal;

said processors having respective reset inputs;

two logic OR-circuits, each of said OR-circuits having an output connected to the reset input of the processor corresponding thereto;

each of said OR-circuits having first and second inputs;

means for applying a start pulse in common to the first inputs of each of said OR-circuits;

two pump circuits corresponding to respective ones of said processors, each of said pump circuits having an input connected to the first output of the processor corresponding thereto and an output connected to the first input of the other one of the processors from which a static watch-dog signal can be taken in dependence upon an applied dynamic watch-dog signal;

two logic AND-circuits, each of said AND-circuits having a first input connected to the second output of the processor corresponding thereto;

each of said AND-circuits having a second input connected to the output of the pump circuit corresponding to the same processor as said AND-circuit for receiving the static watch-dog signal of the pump circuit; and,

each of said AND-circuits having an output connected to the second input of the OR-circuit corresponding to the other processor.

4,881,228

DEBUGGING MICROPROCESSOR

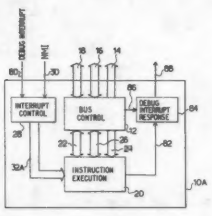
Masahiro Shouda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 114,285

Claims priority, application Japan, Oct. 29, 1986, 61-258915

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—19 **6 Claims**



1. A debugging processor comprising:

a bus control unit for transmitting and receiving data, address and control signals to and from an external microprocessor development support system,

an instruction execution unit coupled to transmit and receive data and address signals to and from the bus control unit and also to receive an instruction code from the bus control unit for executing the given instruction, said instruction execution unit having a fixed branch destination address for a debug interrupt operation,

an interrupt control unit coupled to receive at least a debug interrupt from the external microprocessor development support system and for notifying the instruction execution unit of an interrupt request, and

a debug interrupt response control unit having a priority higher than that of the interrupt control unit,

said execution unit operating in response to the notification of the interrupt request from the interrupt control unit to instruct the bus control unit to start an internal information save operation after there have been completed an execution of an instruction which is being executed when the instruction execution unit is notified of the interrupt

request, the execution unit also operating to notify the debug interrupt response control unit of the instruction of the internal information save operation to the bus control unit,

said bus control unit responding to the instruction of the internal information save operation from the execution unit to output a signal indicative of an execution of a bus cycle for the internal information save operation to the debug interrupt response control unit, in synchronism with a bus cycle of the bus control unit, after there has been completed a bus cycle which is being executed when the start of the internal information save operation of the execution unit is detected, so that the debug interrupt response control unit operates to generate to the external microprocessor development support system a debug interrupt response signal which becomes active only during a period of save operation for the internal information, and thereafter, the execution unit operating to move into an operation for the debug interrupt.

4,881,229

TEST CIRCUIT ARRANGEMENT FOR A COMMUNICATION NETWORK AND TEST METHOD USING SAME

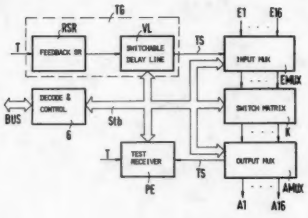
Gunter Kaltbeitzel, Schwieberdingen; Michael Klein, Ruckersdorf; Martin Renner, Mettmann, and Joachim Wolk, Besigheim, all of Fed. Rep. of Germany, assignors to Alcatel, N.V., Amsterdam, Netherlands

Filed Oct. 21, 1987, Ser. No. 111,935

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636427

Int. Cl.[4] G05F *11/02*

U.S. Cl. 371—20.4 **10 Claims**



1. A circuit arrangement comprising:

at least one signal input terminal,

at least one signal output terminal,

signal path means for providing a signal path from a selected said signal input terminal to a selected said signal output terminal,

said signal path means comprising

a selecting multiplexer for allowing the signal path to be opened at a predetermined point thereof and a test signal to be injected into a subsequent portion of the signal path between said predetermined point and the selected signal output terminal,

input and output means for inputting control data to control the selecting multiplexer and for outputting operating parameters,

a test-signal generator for injecting a test signal through the selecting multiplexer to said subsequent portion,

an error-detection circuit for checking a received test signal for transmission errors and for providing operating parameters including an indication of any detected errors to said input and output means, and

test access means for providing said error-detection circuit access to said signal path at least one point of said subsequent portion.

4,881,230

EXPERT SYSTEM FOR PROCESSING ERRORS IN A MULTIPLEX COMMUNICATIONS SYSTEM

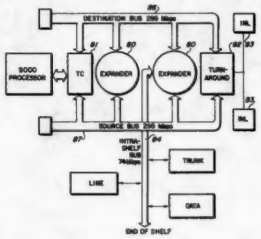
Mark E. Clark, San Jose; Richard G. Greever, Sunnyvale; Larry J. Schmier, Santa Rosa, and Jerome D. Wong, Sunnyvale, all of Calif., assignors to IBM Corporation, Armonk, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,772

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[4] G06F *11/32*; H04B *3/46*

U.S. Cl. 371—20.1 **11 Claims**



1. A method to analyze errors in a system, the system having a plurality of resources with replaceable units, a display, a processor, and memory means for storing decision trees, data structures, and error analysis tasks, the resources including a diagnostics card having a processor and memory means for storing resource analysis tasks, and communication resources, the method comprising the steps of:

(a) testing said resources intermittently by said error analysis tasks invoking a card analysis task on said diagnostics card to test for an error in said communication resources in said system;

(b) detecting an error and invoking an appropriate error analysis task to further diagnose the cause of said error;

(c) isolating said error to a replaceable unit by automatically traversing said decision trees in said error analysis task on said diagnostics card;

(d) writing data to record said error in said data structure in said memory of said system; and

(e) displaying a message indicative of said error on said display of said system.

4,881,231

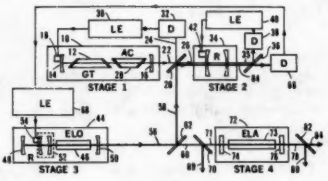
FREQUENCY-STABILIZED LINE-NARROWED EXCIMER LASER SOURCE SYSTEM FOR HIGH RESOLUTION LITHOGRAPHY

Kantilal Jain, 18 Algonquian Trail, Briarcliff Manor, N.Y. 10510

Filed Nov. 28, 1988, Ser. No. 277,028

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—32 **22 Claims**



1. An excimer laser source system emitting radiation charac-

terized by a wavelength with a high degree of stability and by a narrow spectral bandwidth, and comprising:

(a) a frequency-stabilized reference laser system of a wavelength different from the wavelength of said excimer laser source system;

(b) a resonator system (34-42,) stabilized by locking its cavity spacing to the wavelength of said reference laser system and comprising: a resonator (34) through which beam (26) from said reference laser system is transmitted; a detector (38) that measures the power in the reference laser beam (35) transmitted through said resonator (34); a piezoelectric transducer (42) that tunes said resonator (34); and a locking electronics system (40) that receives input from said detector (38) and drives said piezoelectric transducer (42) in such a way that the power in said transmitted reference laser beam (35) is maximized so as to keep the cavity spacing of said resonator (34) locked to the reference laser wavelength; and

(c) an excimer laser oscillator (44,), another detector (66) and another locking electronics system (68); said excimer laser oscillator (44) comprising a laser gain medium (46), laser cavity mirrors (48, 50), an intra-cavity resonator (52) and another piezoelectric transducer (54); and the output beam (56) from said excimer laser oscillator (44) being spectrally narrowed and frequency-stabilized by measuring its intensity with said detector (66) after transmitting it through said first resonator (34,), and inputting the signal from said detector (66) into said locking electronics system (68) to drive said piezoelectric transducer (54) and fine-tune said intra-cavity resonator (52) in such a way that the transmission of said excimer laser oscillator beam (56) through said first resonator (34,) is maximized.

4,881,232

METHOD AND APPARATUS FOR ERROR CORRECTION

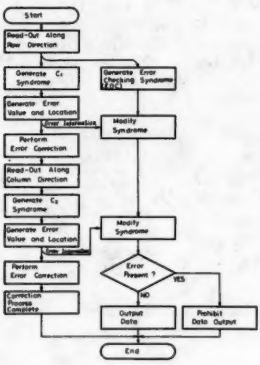
Yoichiro Sako, and Shinichi Yamamura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,472

Claims priority, application Japan, Feb. 10, 1987, 62-029351

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—37.4 **13 Claims**



1. An error-correcting method for checking whether an error occurs in a predetermined data arrangement that includes an error-correcting parity for correcting an error by effecting an error-correcting process by the use of said error-correcting parity and an error-checking parity for checking an error by effecting an error-checking process by the use of said error-checking parity, said error-correcting method comprising the steps of:

(a) producing an error-correcting syndrome using said error-correcting parity during said error-correcting process;

(b) producing an error-checking syndrome substantially simultaneously with said producing of said error-correcting syndrome; and

(c) amending said error-checking syndrome on the basis of error information produced during said error-correcting process, whereby an amended error-checking syndrome is finally produced by the time the error-correcting process is completed.

4,881,233

LASER WITH IMPROVED COOLING SYSTEM

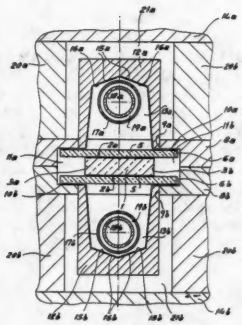
Hans-Peter von Arb, Kapfstrasse 38, 6020 Emmenbrücke, Switzerland; Ulrich Dürr, Mozartstrasse 28, 7310 Plochingen, Fed. Rep. of Germany; André Gressly, Honeggweg 16a, 3610 Steffisburg, and Franz Studer, Dammstrasse 34, 5200 Windisch, both of Switzerland

Filed Jun. 22, 1988, Ser. No. 209,708

Claims priority, application France, Jun. 22, 1987, 87 08791

Int. Cl.[4] H01S *3/045*

U.S. Cl. 372—35 **19 Claims**



1. A cooled optical pumped laser having a laser medium in the form of a slab, said slab having at least two opposing parallel pumping faces between which a laser beam develops by propagation along a zig-zag path by means of total reflection between said opposing parallel pumping faces whereby a monolayer of solid material is directly applied to each one of said opposing parallel pumping faces, said solid material having a refractive index less than that of the slab and being at least indirectly in heat exchanging relationship with a cooling fluid, and wherein the material of said monolayer of solid material is transparent to the optical energy used to excite the medium of said slab.

4,881,234

METHOD FOR FORMING COPIOUS $(F_2^+)_A$ CENTERS IN CERTAIN STABLE, BROADLY TUNABLE LASER-ACTIVE MATERIALS

David R. Foster, Falls Church, and Irwin Schneider, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

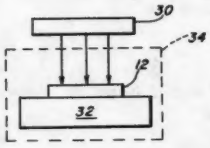
Filed Mar. 18, 1987, Ser. No. 27,473

Int. Cl.[4] H01S *3/16*

U.S. Cl. 372—42 **2 Claims**

1. A laser-active material having regenerable color centers, comprising: a lithium-doped potassium iodide crystal free of

nitrogen contamination and having points defects consisting of F_2, F_{2A}, F_2+ and $(F_2+)_A$ color centers in the crystal structure,



the $(F_2+)_A$ color centers being laser-active regenerable color centers.

4,881,235

SEMICONDUCTOR LASER HAVING A MULTIPLE QUANTUM WELL STRUCTURE DOPED WITH IMPURITIES

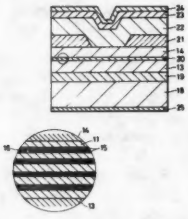
Naoki Chinone; Kazuhisa Uomi, both of Hachioji; Tadashi Fukuzawa, Tokyo; Hideaki Matsueda, Tokorozawa; Takashi Kajimura, Tokyo, and Tsukuru Ohtoshi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 888,073, Jul. 22, 1986. This application Apr. 23, 1987, Ser. No. 41,410

Claims priority, application Japan, Jul. 26, 1985, 60-164002; Sep. 13, 1985, 60-201543; Apr. 23, 1986, 61-92093

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—45 **40 Claims**



1. A semiconductor laser comprising:

a semiconductor substrate;

a plurality of semiconductor layers formed on the substrate, the plurality of semiconductor layers including a cladding layer, at least one active layer and at least one barrier layer, the at least one active layer and at least one barrier layer being stacked alternately so as to form a multiple quantum well structure and together forming an active region, and a resonant cavity including said active region, wherein the at least one active layer respectively has a thickness that is smaller than a wave packet of free electrons within a crystal, and wherein the active region has a light emitting portion in which there is a part doped with impurities, the impurity concentration thereof being larger than $10^{18}cm^{-3}$; and

a pair of electrodes for injecting carriers into the light emitting portion, to emit light.

4,881,236

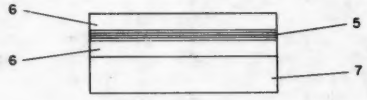
WAVELENGTH-RESONANT SURFACE-EMITTING SEMICONDUCTOR LASER

Steven R. J. Brueck; Christian F. Schaus; Marek A. Osinski, all of Albuquerque; John G. McInerney, Cedar Crest; M. Yasin A. Raja; Thomas M. Brennan, both of Albuquerque, and Burrell E. Hammons, Tijeras, all of N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Apr. 22, 1988, Ser. No. 184,745

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—45 **8 Claims**



2. A semiconductor laser medium comprising pumping means for providing energy, a resonating gain medium for receiving said energy whereby standing electromagnetic waves are generated therein and composed of a first plurality of thin semiconductor bodies each acting as a quantum well of small bandgap and each equally separated from the other by a space, and a second plurality of thick semiconductor bodies, each thick body with a bandgap substantially larger than said small bandgap and occupying the space between adjacent ones of said first semiconductor bodies, both of said pluralities of bodies thereby constituting a stack of thick and thin semiconductor bodies alternately oriented along a line, the thickness of each of said thin semiconductor bodies in the direction of the line being at most approximately one-tenth the thickness of each of the thick semiconductor bodies and the combined thickness of a pair of adjacent thin and thick bodies being approximately equal to an integral multiple of one-half the lasing wavelength of the medium, whereby each of the maxima of the standing waves of the elctromagnetic field of the medium are in approximate registration with each of the thin semiconductor bodies.

4,881,237

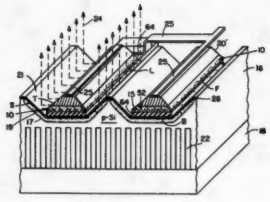
HYBRID TWO-DIMENSIONAL SURFACE-EMITTING LASER ARRAYS

Joseph P. Donnelly, Carlisle, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 26, 1988, Ser. No. 237,149

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—50 **30 Claims**



1. A hybrid laser array comprising:

(a) an array substrate having a plurality of longitudinally extending grooves formed on a surface thereof with each groove comprised of a pair of inclined light reflective walls extending toward each other and terminating on a flat surface; and

(b) a linear array of laser edge emitting devices mounted in each groove, each laser device being formed with a region of light emitting material located within a resonant optical

cavity formed between two electrodes for emitting laser light for reflection off the reflective surface of said light reflective walls.

4,881,238

SEMICONDUCTOR LASER HAVING QUANTUM WELL ACTIVE REGION DOPED WITH IMPURITIES

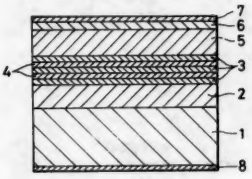
Naoki Chinone, Hachioji; Kazuhisa Uomi, Kokubunji; Tadashi Fukuzawa, Tokyo; Hideaki Matsueda, Tokorozawa, and Takashi Kajimura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,073

Claims priority, application Japan, Jul. 26, 1985, 60-164002; Sep. 13, 1985, 60-201543

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—68 **51 Claims**



34. A semiconductor laser comprising:

a semiconductor substrate;

a semiconductor layers stacked structure on the semiconductor substrate, the semiconductor layers stacked structure including a resonant cavity which includes an active region, wherein the active region has a quantum well structure, and wherein at least a portion of the active region is doped with impurities at an impurity density of not less than 1×10^{18} cm^{-3}; and

a pair of electrodes for injecting carriers so as to make the active region emit light.

4,881,239

FAULT DETECTION DURING REMELT OF ELECTRODES INTO BLOCKS

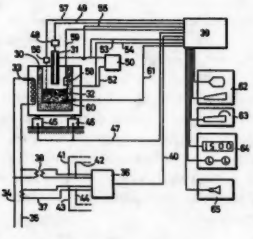
Otto Stenzel, Gründau; Felix Müller, Gelnhausen; Gerhard Brückmann, Asslar, and Alok Choudhury, Püttlingen, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 201,588

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723166

Int. Cl.[4] H05B *7/148*

U.S. Cl. 373—70 **16 Claims**



1. Apparatus for detecting the location of a fault in a metallic block during the remelting of an electrode in a vacuum are furnace to form said block, said apparatus comprising

means for monitoring a first process parameter,

means for monitoring a second process parameter,

means for continuously correlating the first process parameter to the second process parameter,

means for comparing the actual correlation of parameters so monitored to the ideal correlation of said parameters for a fault-free electrode, and

means for determining the position of faults in the block from deviations between the actual correlation and the ideal correlation.

4,881,240

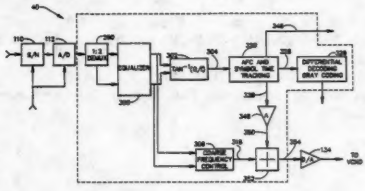
AM EQUALIZER CIRCUIT FOR DIGITAL SYSTEMS

David N. Critchlow; Graham M. Avis; Sandra J. Earlam, all of San Diego; Karle J. Johnson, Carlsbad; Bruce A. Smetana, Escondido; Gregory L. Westling, Poway, all of Calif.; Eric Paneth, Givataiim, Israel, and Moshe Yehushua, San Diego, Calif., assignors to International Mobile Machines Corporation, Philadelphia, Pa.

Division of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448. This application Oct. 12, 1988, Ser. No. 256,557

Int. Cl.[4] H03H *7/30*; H03K *5/159*

U.S. Cl. 375—15 **5 Claims**



1. In a subscriber unit for a wireless digital telephone, an equalizer circuit comprising

an input for time multiplexed I and Q samples;

means for applying said time multiplexed I and Q samples, in the form of complex sample pairs/symbol, to a demultiplexer;

an equalizer coupled to said demultiplexer for receipt therefrom of the demultiplexed I and Q samples;

frequency error detection means coupled to said equalizer to produce a frequency error signal;

said detection means including means for applying a plurality of training signals to said equalizer, said training signals corresponding to undesirable characteristics that might be present in the demultiplexed I and Q samples;

means for comparing the actual inputs applied to said equalizer with a set of desired outputs during the presentations of each of said training signals to obtain a set of weighting coefficients; and

frequency correction means coupled to said frequency error detection means to provide a corrected frequency signal.

4,881,241

METHOD AND INSTALLATION FOR DIGITAL COMMUNICATION, PARTICULARLY BETWEEN AND TOWARD MOVING VEHICLES

Daniel Pommier, Breal sous Montfort, and Michel Alard, Rennes, both of France, assignors to Centre National d'Etudes des Telecommunications, Issy les Moulineaux and Telediffusion de France, Paris, both of, France

Filed Feb. 24, 1988, Ser. No. 159,920

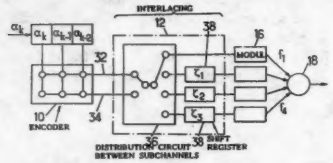
Int. Cl.[4] H04B *7/02*

U.S. Cl. 375—38 **8 Claims**

1. Digital broadcasting process comprising:

sampling information from a source to obtain data consisting of digital words,

encoding the bits of said words using a redundant encoder to obtain a sequence of modulation symbols representing a message,



transmitting said symbols in a plurality M of subchannels at different frequencies, with simultaneous transmission of M different ones of said symbols with such time interlacing that two adjacent symbols in the message cannot be transmitted in time succession at the same one of said frequencies, each symbol being transmitted once only.

4,881,242

CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF DATA SIGNALS

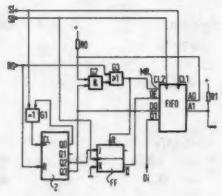
Herbert Haberer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,679

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630699

Int. Cl.[4] H04L *7/08;* **H04J** *3/07*

U.S. Cl. 375—118 **3 Claims**



1. Circuit arrangement for the transmission of data signals, including a memory arrangement (FIFO) wherein signal bits forming the data signals can be read in a read-in time points determined by the occurrence of pulses of a first clock pulse train and from which the data signal bits can be read out at read-out time points determined by the occurrence of pulses of a second clock pulse train, and having a monitoring arrangement which, on the occurrence of a defined deviation of the read-in time points for the individual data signal bits from the read-out time points respectively allocated thereto, provides a control signal for such a change of the read-out, or as the case may be, the read-in time points, that the desired time separation between these time points is again brought about, comprising:

said monitoring arrangement providing a test bit, wherein said test bit, being periodically repetitively provided by the monitoring arrangement, having a predetermined binary value, and, subject to control by said pulses of both clock pulse trains in parallel with the data signal bits is readable into the memory arrangement and, together with these signal bits, is readable out again therefrom, the monitoring arrangement at its initialization enabling reading out of data signal bits and test bits previously read into the memory arrangement with delay such that following thereafter, a phase relationship exists between test bits read into and read out from the memory arrangement corresponding to said time separation between read-in time points and respective read-out time points corresponding thereto for data signal bits into or out of the memory arrangement, the monitoring arrangement causing a time limited disabling of the memory arrangement with regard to the reading out of data signal bits and test bits upon the exceeding of a defined predetermined change in this phase relationship by providing said control signal, such that the desired phase relationship between test bits read in and read out is at least substantially reestablished.

4,881,243

SIGNAL TIMING CIRCUITS

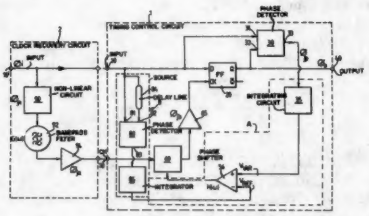
Steven Whitt, Ipswich, England, assignor to British Telecommunications public limited company, United Kingdom

Filed Jun. 6, 1985, Ser. No. 741,881

Claims priority, application United Kingdom, Jun. 7, 1984, 8414517

Int. Cl.[4] H04L *7/02*

U.S. Cl. 375—4 **36 Claims**



30. A retiming circuit for digital signals ϕ_i comprising:

(a) means for providing timing signals;

(b) phase adjusting means for adjusting the phase of the timing signals;

(c) gating means for gating digital signals (ϕ_i) with the timing signals when adjusted by said phase adjusting means, thereby to generate re-timed digital signals (ϕ_o); and

(d) negative feedback control means having a first input connected to receive the digital signals (ϕ_i), a second input connected to receive re-timed digital signals (ϕ_o) and an output connected to said phase adjusting means and providing at said output a signal representing the phase difference between singals applied to its first and second inputs whereby said negative feedback control means is responsive to the phase difference between the digital signals and said negative feedback control means is adapted to adjust the phase adjusting means so as to maintain a predetermined phase relationship between the timing signals and the digital signals;

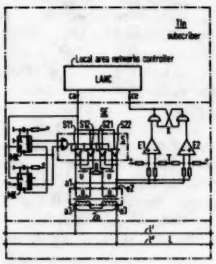
wherein said circuit is arranged to control the phase of clock signals relative to non-return-to-zero coded of binary digital signals.

4,881,244

TRANSMISSION-RECEPTION EQUIPMENT FOR A BUS SYSTEM

Friedrich Haug, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,746
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642374
Int. Cl.[4] H04B 3/00; H04L 25/00
U.S. Cl. 375—36 12 Claims



1. A transmission-reception equipment for a bus system having two signal conductors, having a difference bus transmission equipment connected respectively to the two signal conductors via difference outputs thereof and capable of two signal statuses, and having a difference bus reception equipment with two difference inputs connected respectively to the two signal conductors, having a repeater having a primary winding subdivided into first and second at least approximately identical halves and having a secondary winding having its two ends connected to the two signal conductors, respectively, having two ends of the two primary winding halves farthest opposed from one another connected to at least one difference bus receiver, and having a resistor connected between two adjacent center ends of the two primary winding halves, comprising the secondary winding having an at least approximately identical number of turns as the primary winding; two ends of the first primary winding half connected to two difference outputs of at least one first difference bus transmitter, two ends of the second primary winding half connected to two difference outputs of at least one second difference bust transmitter having its input side connected parallel to an input side of the first difference bus transmitter, and the value of resistance of said resistor being high in comparison to an output resistance of the bus line transmitters and low in comparison to an input resistance of the bus line receiver.

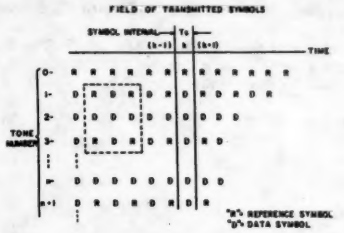
4,881,245

IMPROVED SIGNALLING METHOD AND APPARATUS

Watson F. Walker, Pittsford, and Jack L. Sutherland, Rochester, both of N.Y., assignors to Harris Corporation, Rochester, N.Y.

Continuation of Ser. No. 510,267, Jul. 1, 1983, abandoned. This application Mar. 27, 1987, Ser. No. 31,190
Int. Cl.[4] H04B 7/02
U.S. Cl. 375—38 17 Claims

15. A communication system comprising:
an input signal representing information to be transmitted;
a predetermined reference signal;
modulating means;
control means receiving said input signal and said reference signal to selectively apply either said input signal or said reference signal to said modulating means, said modulating means being operable to modulate a plurality of different tones in response to the signal selectively applied by said control means to produce a plurality of modulated tones; and
demodulating means to demodulate said plurality of modulated tones and to recover said input signal, wherein each element of said input signal is recovered with reference to elements of said predetermined reference signal transmitted on the same tone.

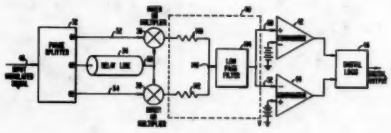


4,881,246

METHOD AND APPARATUS FOR DEMODULATING A CLASS OF M-ARY PHASE SHIFT KEYED (PSK) SIGNALS

James C. Long, Sunnyvale, Calif., assignor to First Pacific Networks, Sunnyvale, Calif.

Filed Feb. 28, 1989, Ser. No. 317,211
Int. Cl.[4] H04L 27/22
U.S. Cl. 375—84 7 Claims

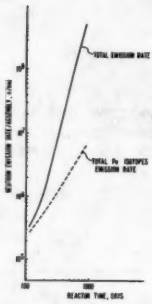


1. A method for demodulating an M-ary phase shift keyed (MPSK) signal wherein modulation is constrained to phase transitions between adjacent phase states, said method comprising the steps of:
dividing a source signal into three paths with a preselected phase relationship among a first phase component, a second phase component and a third phase component;
delaying said second phase component by nominally one bit period, said delayed second phase component having a phase difference relative to both said first phase component and said third phase component, to produce a delayed-phase component;
mixing a representation of the delayed-phase component and said first phase component to produce a first mixed signal;
mixing a representation of the delayed-phase component and said third phase component to produce a second mixed signal;
combining said first mixed signal and said second mixed signal to produce a weighted mixed signal according to expected input signal type; and
comparing said weighted mixed signal against preselected decision thresholds in at least one comparator means to produce a digital output signal.

4,881,247
MEASURING NUCLEAR FUEL BURNUP

Richard C. Smith, O'Hara Township, Allegheny County; John Bartko, Monroeville, and Arnold H. Fero, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 91,359, Aug. 28, 1987, abandoned, which is a continuation of Ser. No. 362,005, Mar. 25, 1982, abandoned. This application Mar. 16, 1989, Ser. No. 325,016
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—257 18 Claims



1. A method of measuring the burnup of nuclear fuel comprising:

(A) measuring the fast neutron counting rate of said nuclear fuel;

(B) reading said burnup off a curve which expresses the relationship between neutron emission rate and burnup for a nuclear fuel of comparable history, where the emission rate which corresponds to said neutron counting rate is obained by multiplying said neutron counting rate by the ratio of the neutron emission rate given by said curve for nuclear fuel of comparable history and known burnup to its similarly measured counting rate, and is defined by the formula

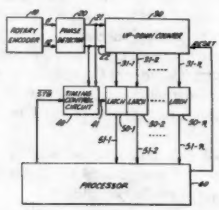
$$n/s = 1.34 \times 10^{-3} 3.92$$

where n/s equals neutron emission rate.

4,881,248
COUNTER CIRCUIT PROVIDED WITH MEANS FOR READING OUT COUNTED DATA BY READ-COMMAND SIGNAL APPLIED ASYNCHRONOUSLY WITH CLOCK SIGNALS TO BE COUNTED

Masako Korechika, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 92,050
Int. Cl.[4] H03K *21/12, 21/40*
U.S. Cl. 377—17 5 Claims



1. A positional information input circuit comprising:

a rotary encoder for generating two kinds of pulse signals representative of positional information;

a counting signal generation circuit coupled to said rotary encoder and generating an up-counting signal or a down-counting signal in response to said two kinds of pulse signals;

an up-down counter executing up-counting and down-counting in response to said up-counting signal and said down-counting signal, respectively;

a processor generating a read-command signal to read a counted value of said up-down counter into said processor;

a read-command signal inhibiting circuit receiving said read-command signal from said processor and generating a controlled read-command signal;

a plurality of latch circuits coupled to respective stages of said up-down counter and enabled when said controlled read-command signal is applied thereto;

a first applying means coupled to said read-command signal inhibiting a circuit and said latch circuits for applying said controlled read-command signal to said latch circuits; and

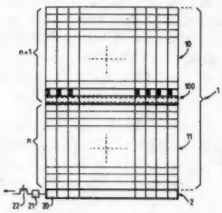
a second applying means coupled to said counting signal generation circuit, said up-down counter and said read-command signal inhibiting circuit for applying said up-counting signal and said down-counting signal to both said up-down counter and said read-command signal inhibiting circuit;

said read-command signal inhibiting circuit inhibiting said read-command signal, when at least one of said up-counting signal and down-counting signal was applied to said read-command signal inhibiting circuit, until said up-down counter terminates an execution of the up-counting or down-counting in response to the same up-counting or down-counting signal which has been applied to said read-command signal inhibiting circuit and thereafter generating said controlled read-command signal.

4,881,249
CHARGE TRANSFER MATRIX TYPE PHOTODETECTOR WITH INTEGRATED CHARGE-FILTERING DEVICE

Jacques Chautemps, St. Egreve, and André Vidal, Brignoud, both of France, assignors to Thomson-CSF, Puteaux, France

Filed May 1, 1989, Ser. No. 345,232
Claims priority, application France, May 3, 1988, 88 05904
Int. Cl.[4] G11C *19/28;* H01L *29/78, 27/14;* H04N *3/14*
U.S. Cl. 377—60 8 Claims



1. A charge transfer matrix photodetector of the type comprising:

a first, partly photosensitive zone, wherein said charges are stored, said first zone having, on a semiconducting substrate:

a plurality of parallel charge transfer devices;

transfer gates, surmounting the transfer channels and being capable of receiving low or high control signals to apply a low or high potential level to the transfer channels, so as to enable the transfer of charges therein;

a second zone, connected to the first zone, capable of receiv-

ing at least a portion of the charges stored in the first zone, and comprising:

a read-out buffer extended by a read diode;

a read gate, surmounting the read-out buffer, and being capable of receiving low or high control signals to apply a low or high potential level to the read-out buffer, so as to enable the transfer of the charges, contained in the read-out buffer, into the read diode; and,

filtering means acting on the read diode to deliver, at output, only useful charges corresponding to a useful portion of the incident light radiation,

wherein the filtering means comprise, in the first zone, an ancillary zone having a region with implantation of a type opposite to that of the substrate, parallel to the transfer channels and followed by a region for the passage of charges, said region being located in the extension of the transfer channels and being surmounted by an ancillary gate capable of receiving high or low ancillary control signals, to apply low or high ancillary levels of potential to the passage region, said ancillary levels of potential being respectively smaller, in terms of absolute value, than the low or high levels of potential produced by the other gates, thus enabling a first filtering of the charges to be performed before their transfer into the read-out buffer.

4,881,250

COMPACT CHARGE-COUPLED DEVICE HAVING A CONDUCTIVE SHIELDING LAYER

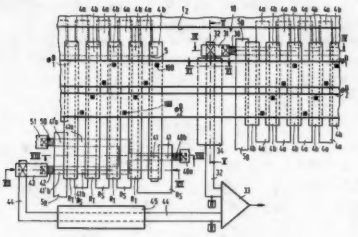
Geert J. T. Davids, and Wiegert Wiertsema, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,551

Claims priority, application United Kingdom, Jul. 10, 1987, 8716237; Netherlands, Jul. 21, 1987, 8701720

Int. Cl.[4] G11C *19/28, 11/34;* **H01L** *29/78*

U.S. Cl. 377—60 **11 Claims**



1. A charge-coupled device, comprising a semiconductor body defining a charge transfer channel, charge storage and charge transfer electrodes for, respectively, defining charge wells within the charge transfer channel and transferring charge between charge wells, clock lines for providing clock signals to the charge storage and transfer electrodes for controlling movement of charge between charge wells and to an output connection of the charge transfer channel, signal processing means for processing an output from the output connection of the charge transfer channel, and a conductive path connecting the output connection and the signal processing means, characterized in that the conductive path crosses at least one of the clock lines and a conductive shielding layer extends between and is electrically isolated from said at least one clock line and the conductive path.

4,881,251

COMPUTED TOMOGRAPH APPARATUS

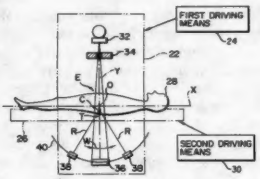
Kyojiro Nambu, and Toshihiro Rifu, both of Tochigi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1987, Ser. No. 78,969

Claims priority, application Japan, Jul. 31, 1986, 61-181061; Aug. 5, 1986, 61-182650; Aug. 5, 1986, 61-182651; Aug. 19, 1986, 61-192015

Int. Cl.[4] A61B *6/02*

U.S. Cl. 378—7 **17 Claims**



1. A computed tomograph apparatus for obtaining tomograms of a subject under examination, comprising:

a supporting table for supporting said subject, and on which a tomogram image pick-up area is defined;

an X-ray source for radiating X-rays onto said image pick-up area, said X-rays proceeding along a slice plane which intersects with said image pick-up area;

a principal detector provided in said slice plane, for detecting X-rays transmitted linearly through said subject placed in said image pick-up area; and

a scattered ray detector provided in an arc existing in a plane perpendicular to said slice plane, for detecting scatter X-ray radiation not transmitted linearly through said subject, said arc having its center in said slice plane and a radius which is equal to the distance between said center and said principal detector.

4,881,252

SHELTERED HOUSING SCHEME COMMUNICATIONS SYSTEM

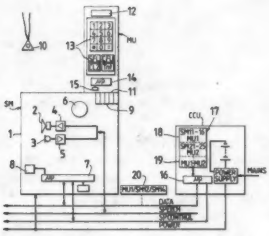
David Jones, North Humberside, and David I. Abbott, West Yorkshire, both of England, assignors to Tunstall Telecom Limited, Yorkshire, England

Filed Jun. 15, 1988, Ser. No. 207,124

Claims priority, application United Kingdom, Jun. 16, 1987, 8714003

Int. Cl.[4] H04M *11/04, 1/64*

U.S. Cl. 379—38 **10 Claims**



10. A speech emergency call system comprising a central control unit; a system cable connected to the central control unit; a plurality of speech modules each capable of handling two-way speech communication, all the speech modules being connected in parallel to the central control unit by the system cable; each speech module having an associated call initiator

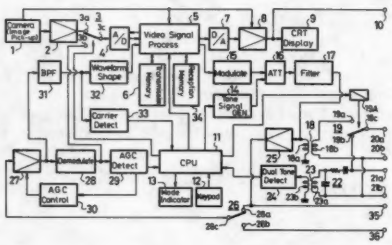
and means for transmitting a unique identity code from that speech module to the central control unit when a call is initiated from that speech module; a plurality of master units, each having a unique distinguishing code, each master unit comprising means whereby it is connectable to the system cable, alerting means capable of response to a call initiated from a speech module and two-way speech communication control means; the control unit including recognition means for recognising the identity code of any calling speech module, and routing means for initially routing all calls from a first group of speech modules as recognized by said recognition means to a first one of said master units, and for intially routing all calls from a second group of speech modules as recognized by said recognition means to a second one of said master units; an interface unit connected between the central control unit and a line of the public telephone network, the interface unit including autodial means for automatically dialling a telephone number; each master unit and the central control unit including emergency call means operative to cause an outgoing call to be autodialled over the public telephone network and for the master unit to be placed in two-way speech communication once the outgoing call has been connected; and the central control unit including means responsive to an incoming call from the public telephone network and for routing that call to any selected master unit, each master unit having means enabling it to receive an incoming call.

4,881,253

MIS-DETECTION OF A VIDEO SWITCHOVER KEY SIGNAL

Kenichi Takeuchi; Shin Saito, both of Tokyo; Shoji Araki, and Atsushi Nakayama, both of Kanagawa, all of Japan, assignors to Nippon Telegraph and Telephone Corporation and Sony Corporation, both of Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,927
Claims priority, application Japan, Jun. 19, 1987, 62-152633
Int. Cl.[4] H04M *11/00*; H04N *7/14*
U.S. Cl. 379—54 **6 Claims**



1. A television telephone system comprising:

(a) an image pick-up section;

(b) a picture receiving display section, said image pick-up section and said picture receiving display section counted within a single housing;

(c) an image pick-up control section for timebase-compressing a desired video signal from said image pick-up by said image pick-up section, transmitting through telephone lines said desired video signal to a television telephone set of the other party, processing said desired video signal and an audio signal from a terminal apparatus of said other party and reproducing the video signal on said picture receiving display section;

(d) a tone signal generating means for generating a tone signal having a predetermined duration, said tone signal being formed of at least of two frequencies and positioned at least at the starting portion of said transmission video signal;

(e) a detecting means for detecting said tone signal having at least two frequencies from a received transmission signal; and

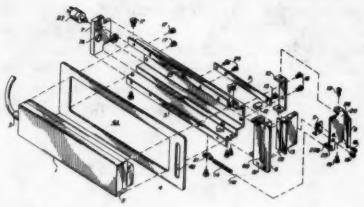
(f) a means for starting the reception processing of the received transmission signal when said tone signals are detected for more than a predetermined ratio of a predetermined period of time from the received transmission signal.

4,881,254

HAND-HELD PAY TELEPHONE AND HOLDER

Edward J. Hollewed, Naperville; John D. Goeken, Plainfield, and Jerome L. Oldani, Aurora, all of Ill., assignors to GTE Mobilnet Incorporated, Houston, Tex.

Filed Dec. 28, 1987, Ser. No. 138,172
Int. Cl.[4] H01M *11/00*
U.S. Cl. 379—144 **37 Claims**



1. In combination:

a hand-held telephone and a telephone holder;

said telephone including a retainer and a latch receiver;

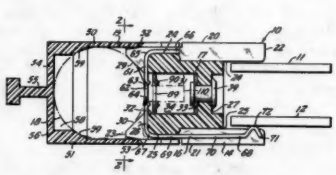
said telephone holder including a telephone receiving cavity, adapted to receive said telephone in response to the manual placement of said telephone within said cavity, a retainer receiver adapted to accept said retainer, a latch operated automatically to engage said latch receiver and in cooperation with said retainer receiver accepting said retainer, maintaining said telephone within said telephone receiving cavity, and a matching plate having an unobstructed opening therein adapted to receive a predetermined implement inserted from the exterior of said telephone holder into said telephone holder to effect movement of said latch and disengagement of said latch receiver so that said telephone may be removed from said telephone holder.

4,881,255

PROTECTOR MODULE FOR QUICK CLIP TERMINAL TELEPHONE CONNECTOR BLOCKS

Helmuth Neuwirth, Garden City, and Carl H. Meyerhofer, Dix Hills, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Sep. 19, 1988, Ser. No. 245,574
Int. Cl.[4] H02H *9/04*
U.S. Cl. 379—412 **3 Claims**



1. An improved subscriber circuit protector module for use with quick clip type telephone connector blocks comprising: a base element having a quick clip receiving recess therein, a

cover element partially overlying said base element, a plurality of elongated quick clip contact elements at least partially surrounding said base element and resiliently maintained thereon, said contact elements having a resilient arm thereon extending into said quick clip retaining recess in said base element and defining a resilient opening in a base portion thereof; said base element having a second recess therein, a ground contact element secured within said recess and having resilient openings therein in aligned relation relative to said openings in said clip contact elements; at least one three-element gas tube having elongated electrodes extending radially from a principal axis thereof, said electrodes each penetrating an opening in one of said clip contact elements and an opening in said ground contact element to establish electrical communication from said quick clip contact element to said ground contact element, said ground contact element having a free end thereon extending outwardly of said base element for communicating with a source of ground potential.

4,881,256

ADJUSTABLE HEAD SUPPORT FOR TELEPHONE HANDSETS

George E. Malekos, 897 Elliott Rd., Paradise, Calif. 95969

Continuation-in-part of Ser. No. 726,141, Apr. 22, 1985, abandoned. This application Mar. 25, 1987, Ser. No. 31,159

Int. Cl.[4] H04M *1/05*; A47F *5/00*

U.S. Cl. 379—449 **6 Claims**

1. An adjustable head support for telephone handsets comprising:

a snap-on mounting ring sized to fit snugly over the earpiece housing ring of a standard telephone handset;

said mounting ring rimmed at two opposite ends with inwardly faced retainer edges;

a socket support member affixed to the outward surface of said mounting ring;

a concave receptacle in said socket support member sized for snap-in connection of

a ball member affixed a one end of

a single-strap headband;

said ball member reinforced at the headband connection by flanged extensions attached to the ball and extending along both flat sides of said headband;

said headband sized for the human head and having adjustability for variations in head size through pliability in the band material;

said headband of semicircular configuration with the ball-attach end angled outwardly and the tip of the opposite end angled outwardly to form a release flap;

said ball and said concave receptacle in cooperative snap-in attachment and snap-out detachment constituting an operational ball and socket connection;

said ball having on the rounded end thereof a short tab extension and

said socket having three rectangular grooves in the base thereof;

said tab on said ball inserted into one of said socket grooves when said ball and socket are engaged providing firm positioning to said headband and said telephone handset;

said ball tab moveable from groove to groove by force applied to said headband adjacent said reinforcing flange extensions said headband and ball connection;

said ball and socket with said ball tab and said socket grooves cooperatively providing adjustability to said headband.

4,881,257

DEFORMATION FREE X-RAY EXPOSURE MASK FOR X-RAY LITHOGRAPHY

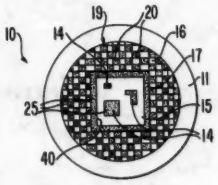
Kenji Nakagawa, Isehara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 23, 1987, Ser. No. 111,679

Claims priority, application Japan, Oct. 28, 1986, 61-254790

Int. Cl.[4] G21K *5/00*

U.S. Cl. 378—35 **10 Claims**



1. An X-ray exposure mask used for patterning a resist layer of a semiconductor wafer using an X-ray beam, said mask comprising:

a membrane, translucent to the X-ray beam, having a planar surface including a centrally located X-ray mask region on the surface and a non-mask region surrounding said X-ray mask region; and

a layer of X-ray absorbing material superposed on said planar surface of said membrane and comprising a first layer portion coextensive with said X-ray mask region and patterned for selectively exposing the X-ray mask region of the membrane surface in a corresponding pattern for selective transmission of an X-ray beam therethrough, and said layer of X-ray absorbing material further comprising a second layer portion coextensive with said non-mask region and patterned for reducing a pattern density of the X-ray absorbing material superposed on the non-mask region and balancing stress in said layer of X-ray absorbing material in the first and second layer portions.

4,881,258

PORTABLE TYPE MOBILE RADIO TELEPHONE

Ryoichi Kaiwa; Michiyoshi Kudo; Keiki Kobayashi, all of Yokohama, Japan; Yuichiro Suganuma, Schaumburg, Ill., and Naotomo Adachi, Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 19, 1987, Ser. No. 87,038

Claims priority, application Japan, Aug. 20, 1986, 61-194301; Aug. 20, 1986, 61-194302; Aug. 20, 1986, 61-194303; Aug. 21, 1986, 61-196163

Int. Cl.[4] H04M *1/02*

U.S. Cl. 379—58 **9 Claims**

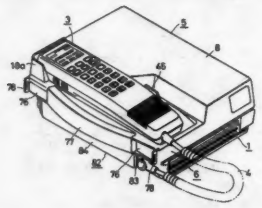
2. A portable type mobile radio telephone comprising:

a transceiver unit with a flat configuration;

battery holding means for holding a battery which is placed on one wider surface of said transceiver unit; and

a cradle for holding a handset which is formed on the one wider surface of said transceiver unit to be in parallel to

said battery holding means, said cradle having engaging means engaged with said handset;



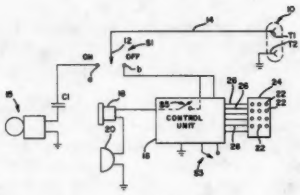
said cradle mounted on a mounting rack which is integrally formed with said battery holding means.

4,881,259

ANSWERING MACHINE WITH CORDLESS TELEPHONE

James Scordato, Elmhurst, Ill., assignor to Dynascan Corporation, Chicago, Ill.

Filed Jan. 6, 1989, Ser. No. 294,429
Int. Cl.[4] H04B 7/26
U.S. Cl. 379—58 **11 Claims**



1. In combination with a telephone answering machine having connector means for making connection to telephone lines, said answering machine including recording and playing means operable to a playing mode for sending out onto telephone lines a recorded announcement and to a recording mode for recording incoming messages thereafter, and system control means operable between an active mode establishing communication between said telephone lines and telephone means and a passive mode establishing communication between said telephone lines and said recording and playing means:

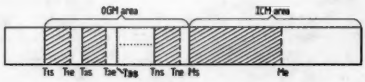
telephone means in the form of a cordless telephone means including a base unit and a portable handset each having transmitter and receiver means, said base unit transmitter including means for transmitting to said handset receiver means ringing signals and incoming messages received from said telephone lines, said handset transmitter means having means for transmitting to said telephone lines through said base unit receiver means voice communications from the user and command means for transmitting to said base unit receiver means user-chosen control signal conditions, said system control means including means responsive to receipt of said control signal conditions by said base unit receiver means for operating said system control means between said active and passive modes, and said recording and playing means, said system control means, and said base unit are contained within a common housing.

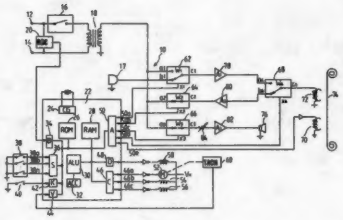
4,881,260

AUTOMATIC TELEPHONE ANSWERING DEVICE WITH MULTIPLE OUTGOING MESSAGES AND SELECTING MEANS

Sayling Wen, Taipei, Taiwan, assignor to Inventa Electronics Co., Ltd., Taipei, Taiwan

Filed Dec. 16, 1987, Ser. No. 133,309
Int. Cl.[4] H04M 1/64, 1/65
U.S. Cl. 379—76 **9 Claims**





1. An automatic telephone answering device having an outgoing message recording operation mode and an automatic answering operation mode, comprising:

ring detecting circuit means for detecting an incoming call and generating a signal when an incoming call is detected;

phone line coupling means responsive to said signal generated by said ring detecting circuit means for connecting the device to a phone transmission line;

a recording medium having an outgoing message recording area which is divided into multiple sections, each of said outgoing message sections having a start position and an end position and being adapted to record one of a plurality of outgoing messages required for explaining different situations;

transducer means for recording messages on said recording medium or picking up the recorded messages therefrom;

drive means for advancing said recording medium relative to said transducer means with either a normal or a fast speed in either a forward or a backward direction;

selecting means for selecting one of said multiple outgoing message sections in order to record by said transducer means a specific outgoing message in said selected one section or play back by said transducer means a specific outgoing message pre-recorded in said selected one section such that a plurality of specific outgoing messages can be recorded respectively in said multiple outgoing message sections of said outgoing message recording area of said recording medium and a calling party can be greeted with one of the specific outgoing messages recorded in said selected section; and

control circuit means including memory means for storing said start position and end position of each of said outgoing message sections, said control circuit means being coupled to said ring detecting circuit means, said phone line coupling means, said transducer means, said drive means, and said selecting means and being programmed so that:

said outgoing message recording operation mode, when a user actuates said selecting means to select one of said outgoing message sections for recording a specific outgoing message, said control circuit means enables said drive means to advance said recording medium with a fast speed

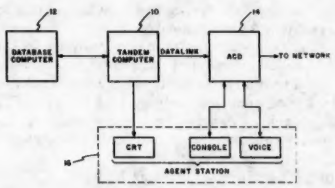
to the start position of said selected section and then enables said transducer means to record said specific message in said selected section while said drive means is enabled to continue to advance said recording medium with a normal speed until the end position of said selected section is arrived, and

during said automatic answering operation mode, when an incoming call is received, as soon as said phone line coupling means has coupled this device to the phone transmission line in response to the signal generated by said ring detecting circuit means, said control circuit means enables said drive means to advance said recording medium with a fast speed to the start position of a specific outgoing message section pre-selected through said selecting means by the user, causes said transducer means to play back the outgoing message recorded in the selected section to the calling party while said drive means is actuated to continue to advance said recording medium with said normal speed until the end position of said selected section has arrived.

4,881,261
METHOD FOR PREDICTIVE PACING OF CALLS IN A CALLING SYSTEM

Jean R. Oliphant, Aurora; Harold W. Workman, Naperville, both of Ill., and Jasvantrai C. Shah, Richardson, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 29, 1988, Ser. No. 245,097
Int. Cl.[4] H04Q 3/00
U.S. Cl. 379—215 **5 Claims**



1. A method of automatically selecting and dialing customer telephone at a paced rate and keeping a plurality of agent stations at full occupancy, comprising:

providing a database containing telephone numbers to be called;

providing a computer for controlling the pacing of telephone numbers to be called connected to said database;

providing an automatic call distribution system for dialing the telephone numbers and establishing connection to the customer telephone and connected to said computer;

providing a plurality of agent stations connected to said computer and to said automatic call distribution system;

determining the maximum number, K, of calls to be in progress at any time by calculating the maximum number, K, such that an average number, Q, of calls waiting in a queue does not exceed a selected delay, DMAX;

initiating a new call only when there are less than K calls existing; and

for a set up state determining the number, NQ, of calls waiting in queue from the maximum permissible number, QMAX, of calls waiting in queue less a known number, NS, of calls dialed and waiting a response;

determining the probability P(NS) of having exactly NS calls in the set-up state from

$$P(NS)=e^{(-R*S)}(R*S)^{NS}/NS$$

where R is the rate of connection to agents and S is the average call set-up time, setting QMAX equal to a large value;

determining the average number, Q, of calls waiting in queue from

$$Q = F*\sum_{i=0}^{QMAX-1}(R*S)^i(QMAX-i)/i!$$

where

$$1/F \text{ is } \sum_{i=0}^{K}(R*S)^i/i!;$$

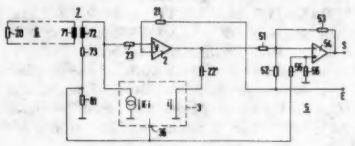
determining the average delay D, in queue from D=Q/R; decreasing QMAX and recalculating Q until D exceeds DMAX; and

determining the value, K, from K=QMAX+M.

4,881,262
ELECTRONIC HYBRID CIRCUIT

Peter Meschkat, Waiblingen, and Jurgen Zanzig, Weil der Stadt, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Nov. 24, 1987, Ser. No. 124,982
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640127
Int. Cl.[4] H04B 3/03
U.S. Cl. 379—402 **3 Claims**



1. An analog electronic hybrid circuit having a predetermined complex internal impedance for connecting a bidirectional two-wire line to a unidirectional receive line and a unidirectional transmit line so as to obtain an impedance match, said hybrid circuit having only one capacitance component and comprising:

a complex impedance network consisting essentially of a parallel combination of said only one capacitance component and a resistance;

a controlled current source having an associated transfer factor and including

a first control input for accepting a control current,

a controlled current output for supplying an output current to the bidirectional line, and

a feedback input to which is applied a feedback signal representative of the current flowing through the bidirectional two-wire line;

an amplifier having

a first input coupled to the bidirectional two-wire line,

a second input coupled to the receive line, and

an output coupled by means of the complex impedance network, to the control input of the controlled current source to thereby produce said control current, said amplifier having an associated gain factor;

a transformer having

a single secondary winding coupled across the two-wire line, and

a primary winding through which passes the output current from the controlled current source and which together with the single secondary winding, defines a transformation ratio and an effective transformer loss resistance;

at least one measuring resistor for producing said feedback signal; and

means for applying to the transmit terminal an output volt-

age which is obtained by summing the voltage across the complex impedance network with a second voltage proportional to the current flowing in the bidirectional two-wire line,

wherein said predetermined complex internal impedance consists essentially of

a series component which is resistive and has an effective resistance determined only by (a) the transformation ratio, and (b) by the effective combined resistance of the transformer loss resistance, of said measuring resistor and of any other resistances in series with the transformer, and

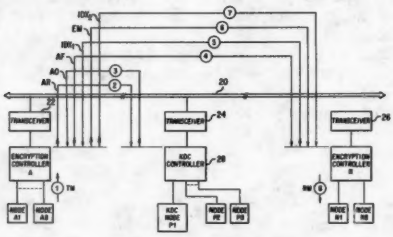
a parallel component effectively coupled in series with said series component and having an effective complex impedance equal to the value of the complex impedance network multiplied by (a) the gain of the amplifier, (b) the transformation ratio of the transformer, and (c) the transfer constant of the controlled current source.

4,881,263

APPARATUS AND METHOD FOR SECURE TRANSMISSION OF DATA OVER AN UNSECURE TRANSMISSION CHANNEL

B. J. Herbison, Clinton, Mass.; Carter Lyman, Merrimack, N.H.; Paul Karger, Acton, Mass.; Bruce Mann, Mason, N.H.; Steve Lipner, Wellesley, Mass., and Arnold Miller, Austin, Tex., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 25, 1987, Ser. No. 101,125
Int. Cl.[4] H04L *9/02*
U.S. Cl. 380—21 **27 Claims**



1. A method for transmitting data packets in a secure manner on an unsecured data transmission channel having a plurality of nodes coupled thereto, each of said nodes including a memory for storing encryption key words for use in encrypting said data packets, said method comprising the steps of:

generating at one of said nodes a data packet for transmission to a target one of said nodes;

searching the memory at said host node to locate an encryption key word designated for use with data packets to be processed by said target node;

assembling, upon determining that no said encryption key word is stored, a key request (AR) data packet; and

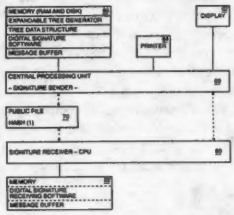
transmitting said AR data packet to a key distribution (KDC) one of said nodes to request assignment of an encryption key word for use in encrypting data packets to be processed by said host and target nodes.

4,881,264

DIGITAL SIGNATURE SYSTEM AND METHOD BASED ON A CONVENTIONAL ENCRYPTION FUNCTION

Ralph C. Merkle, 1134 Pimento Ave., Sunnyvale, Calif. 94087

Filed Jul. 30, 1987, Ser. No. 79,675
Int. Cl.[4] H04K *1/00*
U.S. Cl. 380—25 **9 Claims**



8. A method of generating digital signatures for signing a series of messages M_i, the steps of the method comprising:

defining a one way hash function F;

defining a tree of signature nodes having a root node and a multiplicity of additional nodes $\{node_i\}$, wherein said tree is infinitely expandable so that each node can be the parent node for a plurality of subnodes, and each subnode has one parent node;

wherein said root node and at least a multiplicity of said additional nodes include:

message signing means for signing a message using a predefined one time signature, and

subnode signing means for signing a plurality of subnodes using a predefined one time signature;

generating a root node authentication value for authenticating said root node by applying said function F to said message signing means and said subnode signing means for said root node, and storing said root node authentication value in a nonsecret location;

generating a signature for message M_i by

(a) generating a message signature for message M_i using said message signing means of node i;

(b) relating said message signature to said root node authentication value by using said subnode signing means for signing each node in said tree which forms a chain of subnodes between said root node and node i; wherein said step of signing each node in said chain is performed by the steps of:

generating a HASH value for said node by applying said function F to said message signing means and said subnode signing means for said node; and

using said subnode signing means of the parent node of said node to generate a signature for said HASH value;

whereby the receiver of message M_i can authenticate message M_i by using said predefined one time signatures to relate said message signature to said root node authentication value.

4,881,265

APEX LOUDSPEAKER

James M. Gala, Jr., Rochester, N.Y., assignor to Soundwave Fidelity Corporation, Rochester, N.Y.

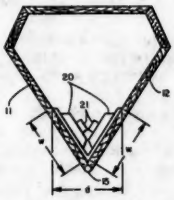
Filed Sep. 13, 1988, Ser. No. 243,711
Int. Cl.[4] H04R *5/02*
U.S. Cl. 381—90 **10 Claims**

1. A loudspeaker comprising:

a. a pair of mounting walls diverging from an apex at an angle of 70° or less, divergent ends of said mounting walls at a distance from said apex being joined to a cabinet closure;

b. a tweeter mounted in an upper region of each of said mounting walls so that drivers of said tweeters are angled into proximity with each other, and said tweeters face outward on opposite sides of said apex;

c. said tweeters being mounted as close to said apex as possible so that a distance spanned by said tweeters, from a viewpoint in front of said apex, approximately equals the frontal width of one of said tweeters;



d. a woofer mounted in each of said mounting walls below said tweeters so that drivers of said woofers are angled into proximity with each other, and said woofers face outward on opposite sides of said apex;

e. said woofers being mounted as close to said apex as possible so that a distance spanned by said woofers from said viewpoint in front of said apex approximately equals the frontal width of one of said woofers; and

f. said tweeters being driven by a single tweeter signal, and said woofers being driven by a single woofer signal.

4,881,266

SPEECH RECOGNITION SYSTEM

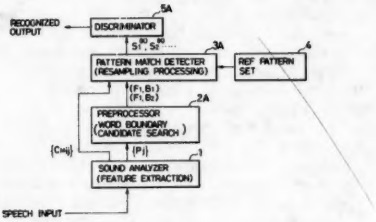
Tsuneo Nitta, Yokohama; Kensuke Uehara, Setagaya, and Sadakazu Watanabe, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 27, 1987, Ser. No. 19,781

Claims priority, application Japan, Mar. 19, 1986, 61-59505

Int. Cl.[4] G10L *5/06, 3/00*

U.S. Cl. 381—43 **14 Claims**



1. A speech recognition system comprising:

(a) means for analyzing a speech signal to obtain feature parameters of the speech signal;

(b) means for determining start and end points when sound power of the speech signal analyzed by said analyzing means drops below a predetermined threshold, a maximum power and a maximum power point, calculating a means noise level, calculating at least one threshold on the basis of the mean noise level, and searching the sound power from the maximum power point in both rearward and forward directions to obtain word boundary candidates when the sound power drops below the calculated threshold level for a predetermined frame time interval to obtain likelihoods of the obtained start and end word boundary candidates on the basis of frame interval length;

(c) means for equally dividing the obtained speech intervals of the obtained word boundary candidates into some sampling points to sample the feature parameters and calculating similiarities between the sampled feature parameters and reference pattern set, at each of the sampling points of the speech interval in the order of the likelihoods from the highest liklihood down to a predetermined lower likelihood; and

(d) means for discriminating the speech signal as recognized outputs on the basis of the calculated similiarities obtained at a plurality of determined candidate speech intervals and arranged in the order of the likelihood.

4,881,267

ENCODER OF A MULTI-PULSE TYPE CAPABLE OF OPTIMIZING THE NUMBER OF EXCITATION PULSES AND QUANTIZATION LEVEL

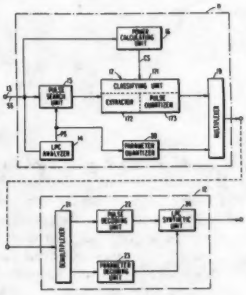
Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,372

Claims priority, application Japan, May 14, 1987, 62-118475

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—40 **5 Claims**



1. An encoder for use in encoding a speech signal into an encoded signal, said speech signal being divided into a succession of frames, said encoder including pulse producing means responsive to said speech signal for producing an excitation pulse sequence including a plurality of excitation pulses in each of said frames, wherein the improvement comprises:

detecting means responsive to said speech signal for detecting electric power of said speech signal to produce a detection signal representative of said electric power by one of a plurality of levels for each of said frames; and

processing means coupled to said pulse producing means and said detecting means for processing said excitation pulse sequence in accordance with said detection signal to produce a processed signal as said encoded signal.

4,881,268

PAPER MONEY DISCRIMINATOR

Shinya Uchida, Kanagawa; Kazuya Kohzu, Nagano; Kiyoshi Fujii, Tokyo, and Moriatsu Kawakami, Kanagawa, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 56,716

Claims priority, application Japan, Jun. 17, 1986, 61-140879; Jun. 17, 1986, 61-92225[U]

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—7 **3 Claims**

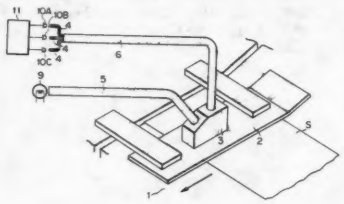
1. A bank note discriminator comprising:

light projecting means for projecting light onto a bank note being transported, said light projecting means including a light source and optical fiber bundles for transmitting light from said light source to the surface of the bank note;

a plurality of detecting means for detecting reflected or transmitted light which issues from a bank note of a certain type in response to the projection of light thereon, said plurality of detecting means being arranged in the widthwise direction of the bank note being transported, each of said plurality of detecting means including optical fiber bundles for transmitting reflected or transmitted light;

two color filter means provided in said optical fiber bundles with respect to each of said plurality of detecting means and selectively transmitting two color components different from each other;

a plurality of calculating means provided with respect to said plurality of detecting means, each calculating means being connected to said optical fiber bundles of one of said plurality of detecting means for producing, in accordance with a time series, the ratio of two color components supplied from said one of said plurality of detecting means;



a plurality of money type identifying means provided with respect to said plurality of calculating means, each money type identifying means successively comparing a pattern signal calculated in a time series by corresponding one of said calculating means from said two color components with reference patterns previously formed and stored in a time series with respect to different money types, and each money type identifying means identifying a money type when judging that the sum of the difference between the pattern signal and one of said reference patterns falls within a predetermined range;

a money type determining means which determines a type of the transported bank note as identifies by said plurality of money type identifying means when all of the types of money respectively identified by said money type identifying means coincide with each other; and

at least one of said plurality of detecting means which are arranged in the widthwise direction of the bank note being transported is positioned such as to be capable of detecting a watermark portion of the bank note being transported.

4,881,269

AUTOMATIC METHOD OF OPTICALLY SCANNING A TWO-DIMENSIONAL SCENE LINE-BY-LINE AND OF ELECTRONICALLY INSPECTING PATTERNS THEREIN BY "SHAPE-TRACKING"

Jean-Marie Billiotte, Noisy Le Grand; Thierry Bouin, Boutigny; Frédéric Basset; Jacques Beauvois, both of Paris, all of France, and Didier Primat, Geneva, Switzerland, assignors to French Limited Company - Centaure Robotique, Montreuil, France

Continuation of Ser. No. 185,313, Apr. 20, 1988, abandoned, which is a continuation of Ser. No. 8,246, Jan. 29, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,869

Claims priority, application France, Jul. 29, 1985, 8511535

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—8 **13 Claims**

1. A method of automatically scanning and inspecting the pattern of a two-dimensional scene line-by-line, without recourse to a reference scene, said pattern including at least two different modulation levels for a scanning electromagnetic wave beam, said levels including a first modulation level representative of first scene zone which is constituted by a series of primary shapes which are separated from one another, and a second level of modulation representative of a second scene zone which is constituted by a series of secondary shape situated between said primary shapes, the method comprising the following steps:

emitting the scanning electromagnetic wave beam towards the scene;

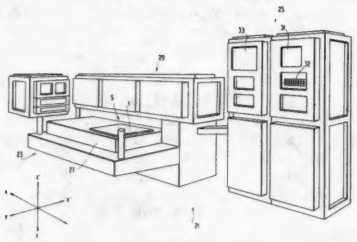
inputting a modulated image of the portion of the scene illuminated by the beam of electromagnetic wages;

extracting a succession of parallel and adjacent linear images from the illuminated portion of the scene;

building up said linear images so as to constitute an inspected strip of the scene;

successively delivering for each linear image (I,j) processed of index (j) a primary analog signal (saj) in which variations in analog signal level are sequentially representative of the scene zones intersected by the linear image (I,j);

digitizing the primary analog signal (saj) in each processed linear image (I,j) in order to transform it by a thresholding technique into a secondary binary signal (sbj) having n bits organized sequentially, with a first bits value in a said secondary binary signal being representative of the processed linear image (I,j) intersecting a primary shape at the first bit location, and with a second bit value being representative of the processed linear image (I,j) intersecting a secondary shape at the second bit location, in addition,



adjacent bits of the same value or "color" constituting contiguous segments (s,i,j) representative of the linear image (I,j) intersecting primary shapes and secondary shapes in the scene;

the method including the improvement of the following steps in combination:

prior to processing a new line lj of index (j), establishing and storing an electronic shape-change file (F,j−1) representative of previously intersected primary shapes and secondary shapes, and also representative of changes in said shapes in the portion of the scanned strip of the scene which has already been processed line-by-line;

prior to processing each new line lj of index (j), establishing and storing series of digital shape count parameters (f,j−1,i.count) within the electronic shape-change file (F,j−1), each shape having such a parameter associated therewith and each shape count parameter being representative of the number of lines during which the shape (f,j−1,i) has been intersected without interruption by successive preceding linear images;

while processing the line lj, processing the secondary binary signal (sbj) relating to said line lj to electronically determine an electronic segment table (s,j)=(s,i,j) for said line and relating to the geometric characteristics of position and color and of the segments (s,j,i) in the linear image (I,j);

using both the electronic shape file (F,j−1) and the electronic segment table (s,j) to establish a new electronic shape file (F,j) for use in conjunction with the following

line of index (j+1), with said new electronic shape file being established electronically in accordance with fixed digital rules for tracking changes in shapes; and

after processing each linear image (I,j), using the old electronic shape-change file (F,j−1) and the segment table (s,j) for the current line of index (j) to update new count parameters (f,j,i.count) for the new shapes (f,j,i) within the new electronic shape-change file (F,j) for use in processing the following line of index (j+1).

4,881,270

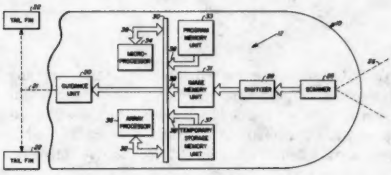
AUTOMATIC CLASSIFICATION OF IMAGES

John A. Knecht, Inyokern, Calif., and Chenoweth, Darrell L., Paoli, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1983, Ser. No. 546,755

Int. Cl.[4] G06K *9/80*

U.S. Cl. 382—17 **2 Claims**



1. A method for the automatic classification of the image of a ship comprising the steps of:

scanning the ship to generate a two-dimensional image thereof represented by a matrix wherein the values of the elements thereof correspond to energy received from portions of the ship, the elements of the rows of the matrix corresponding to such portions spaced substantially horizontally and longitudinally of the ship and the elements of the columns of the matrix corresponding to such portions spaced substantially vertically;

summing predetermined elements of a plurality of said columns to generate a first vector in which the components thereof correspond individually to the columns of said plurality;

performing a discrete Fourier transform on the components of said first vector and squaring selected coefficients resulting from said transform to generate a feature vector which is the power spectrum of the first vector and which corresponds to said ship;

obtaining a plurality of such feature vectors under relatively ideal scanning conditions, the feature vectors of said plurality thereof corresponding individually to images of a ship of a predetermined class at a plurality of aspect angles and at a predetermined range; deriving from said plurality of feature vectors a decision rule corresponding to said class;

obtaining such a feature vector from such an image of a potential target ship; and

comparing the feature vector from the image of the potential target ship with said decision rule to classify said target ship as being in said class or as being outside said class.

4,881,271

PORTABLE WIRELESS COMMUNICATION SYSTEMS

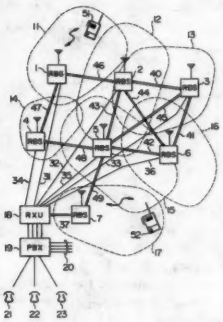
Yukiji Yamauchi, Kokubunji; Nobuo Tsukamoto, Tachikawa, and Masahiro Koya, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1988, Ser. No. 153,906

Claims priority, application Japan, Mar. 20, 1987, 62-63784; Nov. 6, 1987, 62-279199

Int. Cl.[4] H04B *1/00*

U.S. Cl. 455—56 **12 Claims**



1. A wireless communication system comprising:

a plurality of base stations each disposed to cover a predetermined area for wireless communications;

a subscriber station movable within any of said predetermined areas and capable of communicating via radio propagation with the base station covering said predetermined area when said subscriber is positioned therein;

a dedicated line provided between adjacent base stations for exchanging information regarding the status of communication by the respective adjacent base stations;

radio exchange means connected between said base stations and other communication systems for exchanging communication between said other communication systems and any of said base stations;

wherein each of said base stations further comprises means for storing control information including information of status of communication by that base station and information of status of communication of adjacent base stations communicated through said dedicated lines, judging means for determining when a call from the subscriber station is received whether the base station covering the predetermined area into which the subscriber station has moved should respond to the call based on the control information stored in said storing means, and means responsive to said judging means having determined that said call should be responded to by one of said base station for selecting a radio channel by which said subscriber station performs communication based on said control information.

4,881,272

MULTI-BAND FM RECEIVER FOR RECEIVING FM BROADCASTING SIGNALS AND TV BROADCASTING SOUND SIGNALS

Toyokazu Eguchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 29, 1988, Ser. No. 175,031

Claims priority, application Japan, Mar. 30, 1987, 62-76638

Int. Cl.[4] H04B *11/16*

U.S. Cl. 455—143 **6 Claims**

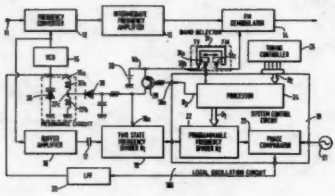
1. A multi-band receiver for receiving a plurality of broadcast signals having first and second groups of frequencies, the

second group including at least two subgroups of frequencies separated by a fixed frequency gap, comprising:

switch means for selecting one of said first and second groups;

tuning control means coupled to the switch means for selecting a desired frequency within the selected one of the first and second groups from a predetermined tuning band;

oscillation means having an oscillation frequency and re-



sponsive to said tuning control means for separating signals of the desired frequency from the received broadcast signals and for demodulating the separated signals into audio frequency signals; and

adjusting means responsive to the switch means and the tuning control means for automatically adjusting the oscillation frequency of the oscillation means when the second group has been selected to substantially remove the fixed frequency gap from the predetermined tuning band.

4,881,273

RDS SYSTEM RADIO

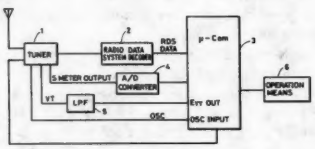
Kazuo Koyama, and Yoshikai Amano, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1988, Ser. No. 236,012

Claims priority, application Japan, Sep. 7, 1987, 62-223773

Int. Cl.[4] H03J *7/00*

U.S. Cl. 455—161 **6 Claims**



1. An RDS-system radio which can receive broadcast waves each including an RDS code containing a program identification code and which has an automatic tuning operation, comprising:

tuner means for selecting and receiving a desired broadcasting wave;

RDS decoder means for decoding the RDS code included in a broadcasting wave received by said tuner means;

control means coupled to said tuner means and responsive to said RDS decoder means in an arithmetic tuning mode for causing said tuner means to switch from receiving an originally broadcasting wave to a first new broadcasting wave if the program identification code of the original broadcasting wave is different from the program identification code of the new broadcasting wave, and for causing said tuner means not to switch to the first new broadcasting wave but to switch to receive a second new broadcasting wave having a program identification code different from the program identification code of said original broadcasting wave when said program identification codes of said original broadcasting wave and said first new broadcasting wave are identical; and

operation means for causing said control means to initiate said automatic tuning mode.

4,881,274

FM MULTIPATH NOISE REDUCTION CIRCUIT

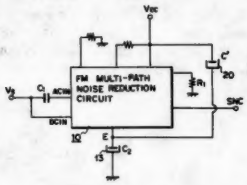
Satoru Tazaki, and Yasuhiro Yoshioka, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,531

Claims priority, application Japan, Feb. 13, 1987, 62-19759[U]

Int. Cl.[4] H04B *1/10*

U.S. Cl. 455—296 **2 Claims**



1. An FM multipath noise reduction circuit, comprising;

a charge/discharge circuit having an output, and having an input to which is applied an S meter voltage which corresponds to a received electric field intensity and which is outputted by an intermediate frequency amplification stage in an FM stereo receiver;

a first condenser having first and second ends, said first end being connected to said charge/discharge circuit;

charge/discharge control circuit means for detecting in said S meter voltage an alternating current voltage corresponding to multipath noise and for causing said charge/discharge circuit to respectively discharge and charge said first condenser in response to detection of the presence and absence, respectively, of said alternating current voltage, said charge/disicharge circuit producing at said output thereof a control voltage having a value which varies as a function of the amount of charge on said first condenser;

a second condenser for rapid charging which has two ends respectively connected to a power source and said first end of said first condenser, said power source further being connected to and supplying power to said charge/discharge circuit and said charge/discharge control circuit means; and

control means for controlling signal separation of the FM demodulation in said FM stereo receiver as a function of said control voltage from said output of said charge/discharge circuit.

DESIGN PATENTS

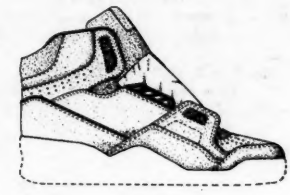
GRANTED NOV. 14, 1989

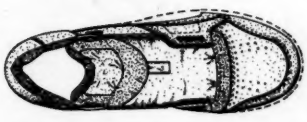
ERRATA

For CLASS	See PATENT NO.
D 6-391	304,523
D14-151	4,564
D34-031	304,575

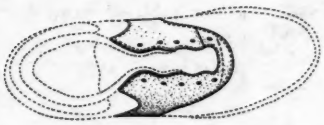
304,515
SHOE UPPER
Patricia D. Quan, Hermosa Beach; Angelo Maccano, Simi Valley, and Robert Y. Greenberg, Woodland Hills, all of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Filed Nov. 10, 1987, Ser. No. 119,415
The portion of the term of this patent subsequent to May 16, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—314

304,516
SHOE UPPER
Lawrence Selbiger, and Peter P. Backus, both of Portland, Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Feb. 2, 1989, Ser. No. 305,207
Term of patent 14 years
U.S. Cl. D2—314

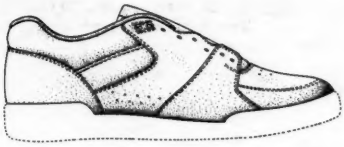


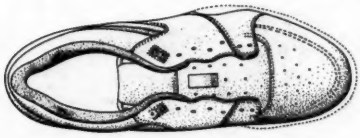


304,517
ELEMENT OF A SHOE UPPER
Juan A. Diaz, Weymouth, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,568
Term of patent 14 years
U.S. Cl. D2—314

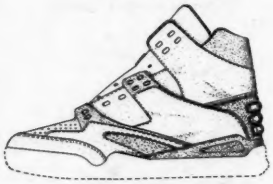


304,518
SHOE UPPER
Paul D. Brown, Hingham, and Christopher Kittle, Cohasset, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,574
Term of patent 14 years
U.S. Cl. D2—314



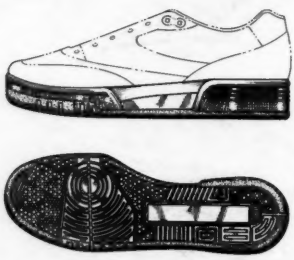


304,519
SHOE UPPER
David E. Miller, Carver, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,575
Term of patent 14 years
U.S. Cl. D2—314



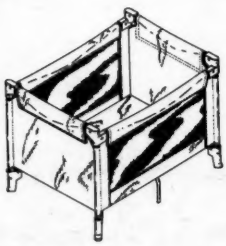
304,520
SHOE SOLE
Larry M. Clark, Simi Valley, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Nov. 5, 1987, Ser. No. 117,733
Term of patent 14 years
U.S. Cl. D2—320

304,521
SHOE OUT SOLE
Larry M. Clark, Simi Valley, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Nov. 10, 1987, Ser. No. 119,982
Term of patent 14 years
U.S. Cl. D2—320



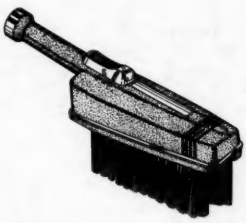
304,522
SUSPENDERS
Richard C. Weidman, and W. Jeffrey Weidman, both of 12020 Greywing Sq., #A3, Reston, Va. 22091
Filed Oct. 14, 1986, Ser. No. 918,852
The portion of the term of this patent subsequent to Mar. 15, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—626

304,523
FOLDABLE PLAYYARD
James M. Dillner, Lancaster, and Nathanael Saint, Morgantown, both of Pa., assignors to Graco Metal Products Inc., Elverson, Pa.
Filed Dec. 8, 1987, Ser. No. 130,341
Term of patent 14 years
U.S. Cl. D6—391

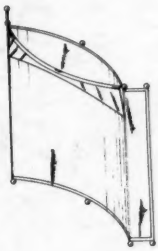


304,524
SEAT BAG
Sandra E. McNeely, 701 Blaine Pike, Portland, Ind. 47371
Filed Nov. 7, 1986, Ser. No. 928,291
Term of patent 14 years
U.S. Cl. D3—42

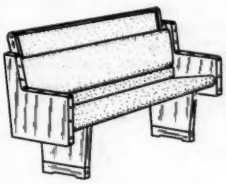
304,525
VEHICLE AND PATIO WASHING BRUSH
Keith D. Kitts, Glenview, and James C. Hand, Glen Ellyn, both of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Feb. 25, 1987, Ser. No. 18,960
Term of patent 14 years
U.S. Cl. D4—115



304,526
EXHIBIT PANEL
C. William Moss, Portland, Me., assignor to Moss Tent Works, Inc., Camden, Me.
Filed Mar. 9, 1987, Ser. No. 23,462
Term of patent 14 years
U.S. Cl. D6—332

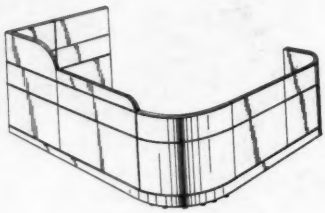


304,527
PEW
Virgil Miller, Archbold, Ohio, assignor to Sauder Manufacturing Co., Archbold, Ohio
Filed Oct. 16, 1986, Ser. No. 919,775
Term of patent 14 years
U.S. Cl. D6—381



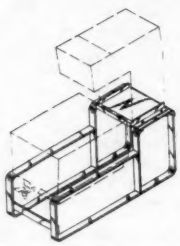
304,528
GARMENT RACK
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatin, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Jan. 9, 1987, Ser. No. 2,303
Term of patent 14 years
U.S. Cl. D6—411

304,529
PANEL UNIT FOR A WORK STATION
Thomas D. Hontz, Quakertown, Pa., assignor to J.G. Furniture Systems, Quakertown, Pa.
Filed Nov. 17, 1986, Ser. No. 931,152
Term of patent 14 years
U.S. Cl. D6—421

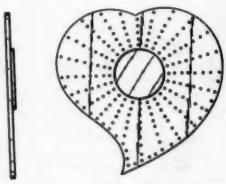


304,530
DESK
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed May 2, 1988, Ser. No. 189,693
Term of patent 14 years
U.S. Cl. D6—422

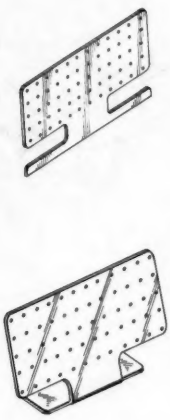
304,531
TEA BREWER STAND
Frank D. Williams, Laplace, La., assignor to Wm. B. Reily & Company, Inc., New Orleans, La.
Filed Dec. 4, 1986, Ser. No. 938,115
Term of patent 14 years
U.S. Cl. D6—464



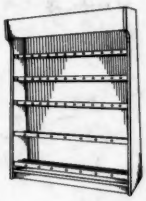
304,532
COMBINED EARRING STAND AND MIRROR
Terry A. Campbell, 1695 Pearson Avenue, Prince George, British Columbia, Canada V2L 4M7
Filed Apr. 13, 1987, Ser. No. 37,445
Term of patent 14 years
U.S. Cl. D6—469



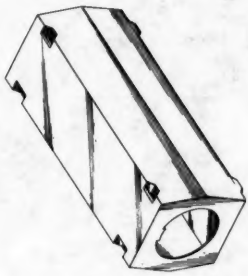
304,533
EARRING STAND
Terry A. Campbell, Prince George, Canada, assignor to Master Link Marketing Inc., Prince George, Canada
Filed Sep. 15, 1986, Ser. No. 907,643
Term of patent 14 years
U.S. Cl. D6—469



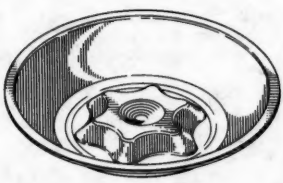
304,534
WIRE DISPENSER RACK
John R. Gustafson, Lincoln, R.I., assignor to Gustafson Enterprises, Inc., Lincoln, R.I.
Filed Dec. 23, 1986, Ser. No. 947,767
Term of patent 14 years
U.S. Cl. D6—469



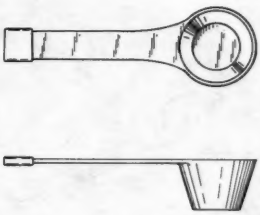
304,535
CUP DISPENSER HOUSING
O. Timothy White, Carnesville, Ga., assignor to Royston Corporation, Royston, Ga.
Filed May 29, 1987, Ser. No. 55,748
Term of patent 14 years
U.S. Cl. D6—516



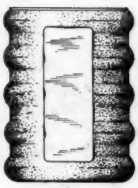
304,536
DISPLAY TRAY FOR FRUIT OR THE LIKE
Dean B. Blaser, Bryan, Ohio, assignor to Potter, Inc., Bryan, Ohio
Filed Mar. 6, 1986, Ser. No. 842,002
Term of patent 14 years
U.S. Cl. D7—27



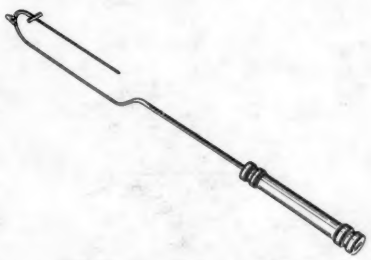
304,537
COMBINATION COFFEE MEASURING SCOOP AND RUBBER NIPPLE
Clark McCarroll, 168 Hillcrest Dr., Munhall, Pa. 15120
Filed Nov. 21, 1986, Ser. No. 933,600
Term of patent 14 years
U.S. Cl. D7—50



304,538
INSULATED CAN HOLDER
James E. Byrns, 1027 2nd Ave. South, Clinton, Iowa 52732
Filed Nov. 24, 1986, Ser. No. 935,689
Term of patent 14 years
U.S. Cl. D7—77

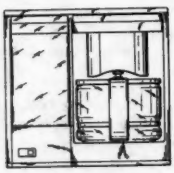


304,539
BARBECUE SPIT
Börje Johansson, Första Hedåkersgatan 1, Kinna, Sweden 511 00
Continuation of Ser. No. 779,052, Sep. 23, 1985. This application Jul. 13, 1988, Ser. No. 194,122
Claims priority, application Sweden, Mar. 22, 1985, 745-85
Term of patent 14 years
U.S. Cl. D7—102

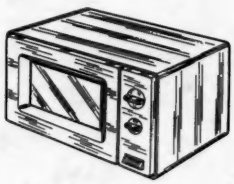


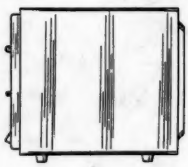
304,540
SPOON FOR USE BY THE HANDICAPPED
James Howard, Dover, and Lue Landsberger, Livingston, both of N.J., assignors to Maddak, Inc., Pequannock, N.J.
Filed Feb. 5, 1987, Ser. No. 11,307
Term of patent 14 years
U.S. Cl. D7—137

304,541
COFFEE MAKER
Florian Seiffert, Wiesbaden, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.
Filed Nov. 17, 1986, Ser. No. 931,635
Claims priority, application Fed. Rep. of Germany, May 27, 1986, URA 699/86
Term of patent 14 years
U.S. Cl. D7—309

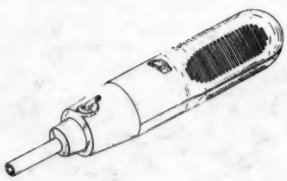


304,542
MICROWAVE OVEN
Seung H. Yoo, Buchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 18, 1987, Ser. No. 16,180
Claims priority, application Rep. of Korea, Aug. 27, 1986, Des.86-12211
The portion of the term of this patent subsequent to Aug. 30, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351





304,543
BATTERY-OPERATED SCREWDRIVER OR SIMILAR ARTICLE
Robert I. Somers, Sparks, and Martin P. Gierke, Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.
Filed Sep. 12, 1986, Ser. No. 907,720
Term of patent 14 years
U.S. Cl. D8—61

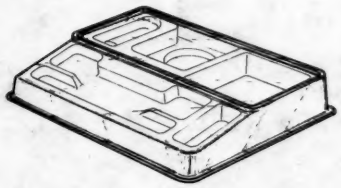


304,544
KEY
Larry E. Lobaugh, 132 Wilson Ave., Niles, Ohio 44446
Filed Mar. 15, 1988, Ser. No. 168,332
Term of patent 14 years
U.S. Cl. D8—347

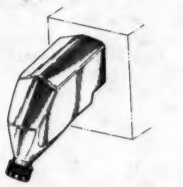
304,545
COAT HANGER RACK
Harold K. Hurrelbrink, Hinsdale, Ill., assignor to Magnuson Group, Burr Ridge, Ill.
Filed Aug. 25, 1986, Ser. No. 855,774
Term of patent 14 years
U.S. Cl. D8—373

304,546
CONTAINER
Keith A. Cattach, South Oakleigh, Australia, assignor to Mallinckrodt Australia Pty. Ltd., Victoria, Australia
Filed Jun. 4, 1986, Ser. No. 870,731
Claims priority, application Australia, Dec. 5, 1985, 3548/85
Term of patent 14 years
U.S. Cl. D9—305

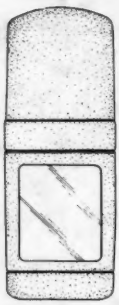
304,547
PLATFORM CONTAINER WITH TRANSPARENT LID
Robert D. Holewinski, Lakehurst, N.J., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.
Filed Mar. 10, 1986, Ser. No. 842,049
Term of patent 14 years
U.S. Cl. D9—347



304,548
WALL MOUNTED DISPENSING BOTTLE
Michael W. Freitas, Irving, Tex., assignor to Dexide, Inc., Fort Worth, Tex.
Filed Jul. 14, 1986, Ser. No. 885,436
Term of patent 14 years
U.S. Cl. D9—373



304,549
BOTTLE
Joël Desgrippes, Paris, France, assignor to Desgrippes, Beauchant, Gobe, France
Filed Feb. 7, 1986, Ser. No. 827,231
Term of patent 14 years
U.S. Cl. D9—377



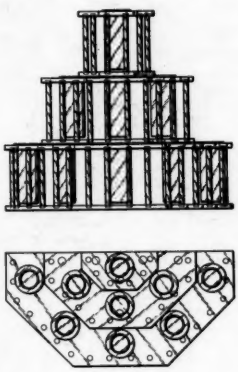
304,550
SQUEEZE BOTTLE AND DISPENSING CAP
Scott W. Demarest, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Sep. 11, 1986, Ser. No. 906,130
Term of patent 14 years
U.S. Cl. D9—377

304,551
PERFUME BOTTLE OR THE LIKE
Joel Desgrippes, Paris, France, assignor to Comptoir Nouveau De La Parfumerie, S.A., Paris, France
Filed Oct. 30, 1986, Ser. No. 925,718
Term of patent 14 years
U.S. Cl. D9—385

304,552
CONTAINER FOR LIQUIDS
Jerome Lippman, 3342 W. Smith Rd., Akron, Ohio 44313
Filed Oct. 30, 1986, Ser. No. 925,117
Term of patent 14 years
U.S. Cl. D9—403

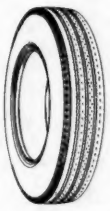
304,553
WATCH FACE
David T. Helsten, 8517 Horner St., Apt. D, Los Angeles, Calif. 90035, and Giovanni Interdonato, 1527 Stanley St., Los Angeles, Calif. 90041
Filed Sep. 17, 1986, Ser. No. 908,516
Term of patent 14 years
U.S. Cl. D10—126

304,554
COMBINED FLOWER VASES AND HOLDER
Edward V. Dinerman, 16 E. Observatory Hill La., Cincinnati, Ohio 45208
Filed Jan. 14, 1987, Ser. No. 3,217
Term of patent 14 years
U.S. Cl. D11—147

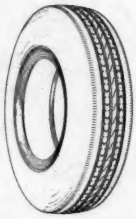


304,555
MOTORCYCLE
Seiji Nishiyama, and Hikoharu Shimokawa, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Jul. 27, 1987, Ser. No. 78,249
Claims priority, application Japan, Jan. 27, 1987, 62-2824
Term of patent 14 years
U.S. Cl. D12—110

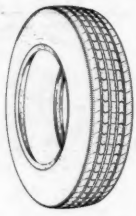
304,556
AUTOMOBILE TIRE
Toru Tsuda, and Kenichi Motomura, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jan. 15, 1987, Ser. No. 3,684
Claims priority, application Japan, Jul. 18, 1986, 61-27934
Term of patent 14 years
U.S. Cl. D12—142



304,557
AUTOMOBILE TIRE
Kiyoshi Ochisi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Feb. 26, 1987, Ser. No. 19,076
Claims priority, application Japan, Sep. 18, 1986, 61-37089
Term of patent 14 years
U.S. Cl. D12—146



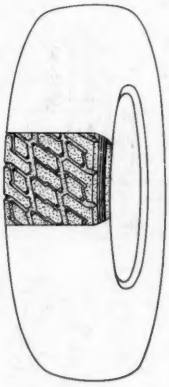
304,558
AUTOMOBILE TIRE
Tetsuhiro Fukumoto, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 17, 1987, Ser. No. 26,646
Claims priority, application Japan, Dec. 9, 1986, 61-48719
Term of patent 14 years
U.S. Cl. D12—146



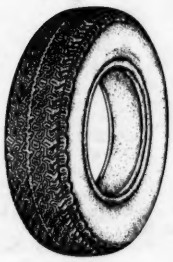
304,559
AUTOMOBILE TIRE
Munemitsu Yamada, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jun. 4, 1987, Ser. No. 57,860
Claims priority, application Japan, Dec. 9, 1986, 61-48720
Term of patent 14 years
U.S. Cl. D12—146

304,560
TIRE
Mario Mezzanotte, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Italy
Filed Jun. 25, 1987, Ser. No. 66,413
Claims priority, application Italy, Jan. 26, 1987, 20620/87[U
Term of patent 14 years
U.S. Cl. D12—146

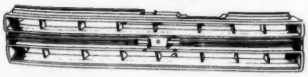
304,561
TIRE
Renato Caretta, Gallarate, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Italy
Filed Apr. 6, 1987, Ser. No. 35,140
Claims priority, application Italy, Oct. 31, 1986, 23565/86[U]
Term of patent 14 years
U.S. Cl. D12—147



304,562
TIRE
James G. Guspodin, Barberton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jun. 11, 1987, Ser. No. 60,587
Term of patent 14 years
U.S. Cl. D12—147

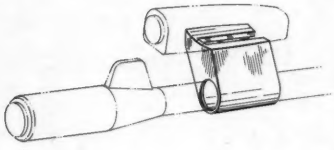


304,563
FRONT GRILLE FOR AN AUTOMOBILE
Mitsuo Ikeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jun. 2, 1986, Ser. No. 869,944
Claims priority, application Taiwan, May 6, 1986, 75302278
Term of patent 14 years
U.S. Cl. D12—163

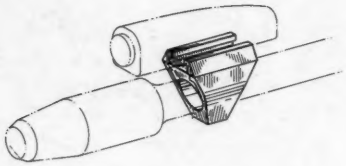


304,564
ATTENDANT TELEPHONE SWITCHBOARD
Shigeaki Kido; Sadao Isozaki, and Yasuko Yajima, all of Tokyo, Japan, assignors to Meisei Electric Co., Ltd.
Filed May 19, 1987, Ser. No. 51,998
Claims priority, application Japan, Dec. 1, 1986, 61-47554
Term of patent 14 years
U.S. Cl. D14—151

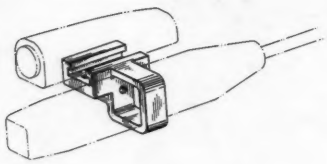
304,565
TURN SIGNAL HANDLE ADAPTOR
Wendell C. Lane, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio
Filed Jun. 10, 1987, Ser. No. 61,985
Term of patent 14 years
U.S. Cl. D12—155



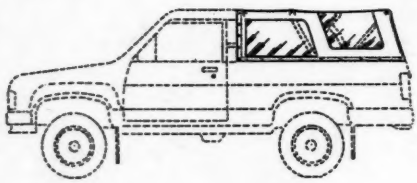
304,566
TURN SIGNAL HANDLE ADAPTOR
Wendell C. Lane, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio
Filed Jun. 10, 1987, Ser. No. 61,986
Term of patent 14 years
U.S. Cl. D12—155



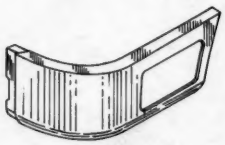
304,567
TURN SIGNAL HANDLE ADAPTOR
Wendell C. Lane, Jr., Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio
Filed Jun. 10, 1987, Ser. No. 61,987
Term of patent 14 years
U.S. Cl. D12—155



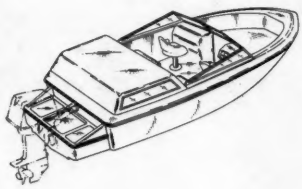
304,568
FOUR WHEEL DRIVE VEHICLE CONVERTIBLE TOP
Charles F. Furphy, 28502 La Noche St., Mission Viejo, Calif. 92692
Filed Apr. 27, 1987, Ser. No. 43,231
Term of patent 14 years
U.S. Cl. D12—156



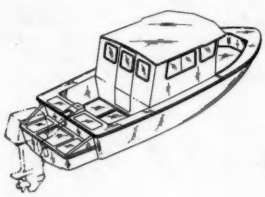
304,569
BUMPER EXTENSION
Ronald N. Brunger, and Larry N. Reynard, both of Ft. Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.
Filed Dec. 4, 1987, Ser. No. 129,039
Term of patent 14 years
U.S. Cl. D12—172



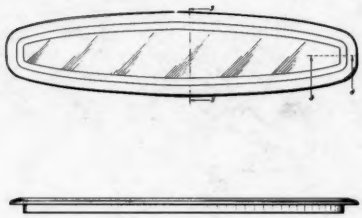
304,570
BOAT
Albert K. Lindstrom, P.O. Box 408, Gardiner, Wash. 98334; David R. Strader, 3100 W. Commodore Way #402, Seattle, Wash. 98199, and George S. Henley, 40516 S. Silver Lake Rd. E., Eatonville, Wash. 98328
Continuation-in-part of Ser. No. 947,706, Dec. 30, 1986. This application Apr. 2, 1987, Ser. No. 33,501
Term of patent 14 years
U.S. Cl. D12—315



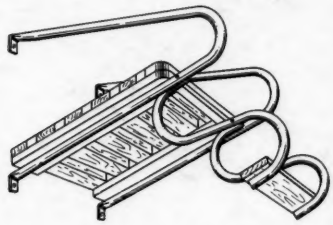
304,571
BOAT
Albert K. Lindstrom, P.O. Box 408, Gardiner, Wash. 98334; David R. Strader, 3100 W. Commodore Way #402, Seattle, Wash. 98199, and George S. Henley, 40516 S. Silver Lake Rd. E., Eatonville, Wash. 98328
Continuation-in-part of Ser. No. 947,706, Dec. 30, 1986. This application Apr. 2, 1987, Ser. No. 33,504
Term of patent 14 years
U.S. Cl. D12—315



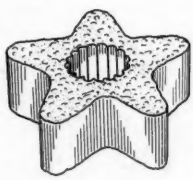
304,572
BOAT WINDOW
Frank S. Beckerer, Jr., 40 Dock Rd., Milford, Conn. 06460
Continuation of Ser. No. 827,093, Feb. 7, 1986, abandoned. This application Nov. 28, 1988, Ser. No. 279,229
Term of patent 14 years
U.S. Cl. D12—317



304,573
SWIM PLATFORM
Andrew K. Hoszowski, Greenville, Miss., assignor to Moeller Manufacturing Co., Inc., Greenville, Miss.
Filed Jul. 7, 1986, Ser. No. 882,626
Term of patent 14 years
U.S. Cl. D12—318



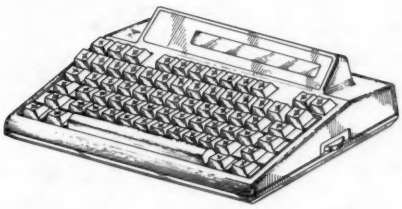
304,574
CHARCOAL FUEL ARTICLE
James E. Fay, III, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 16, 1987, Ser. No. 39,489
Term of patent 14 years
U.S. Cl. D13—3.2



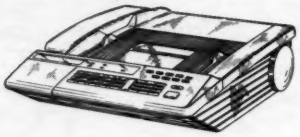
304,575
SUPPORT PAD FOR A RECREATIONAL VEHICLE JACK OR THE LIKE
Charles Batzel, 5223 Ruby St., Oak Lawn, Ill. 60453
Filed Jul. 24, 1987, Ser. No. 77,322
Term of patent 14 years
U.S. Cl. D34—31

304,576
ELECTRONIC CONTROL DESK
Daniel Vissiere, 185 Avenue de la Jouannenque, 30340 Salindres, France
Filed Sep. 10, 1986, Ser. No. 905,946
Term of patent 14 years
U.S. Cl. D14—103

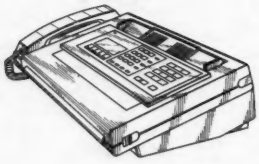
304,577
ALPHANUMERIC ENCODING TERMINAL OR SIMILAR ARTICLE
William J. Scheid, Coral Springs; Richard J. Toth, Boca Raton, and Robert J. Schwendeman, Pompano Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 22, 1986, Ser. No. 923,078
Term of patent 14 years
U.S. Cl. D14—106



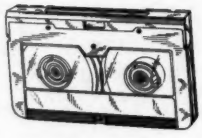
304,578
FACSIMILE TRANSCEIVER
Masahito Saegusa, Mitaka; Kazunori Hashimoto, Tachikawa; Takashi Ohwada, Mitaka; Yoshihiro Kawakatsu, Sayama; Katsubumi Ohuchi, Chigasaki; Hiroshi Endo, Yokohama, and Taichiro Yamashita, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 28, 1987, Ser. No. 101,548
Claims priority, application Japan, Mar. 27, 1987, 62-11310
Term of patent 14 years
U.S. Cl. D14—118



304,579
FACSIMILE TRANSCEIVER
Yoshiyuki Fujiyama, Nagano; Sumio Ogawara, Tokyo; Akira Chiku, Nagano; Toshihiro Kumano, Nagano, and Yoshitatsu Okiyama, Nagano, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan
Filed Oct. 2, 1987, Ser. No. 103,976
Claims priority, application Japan, Apr. 6, 1987, 62-13296
Term of patent 14 years
U.S. Cl. D14—118

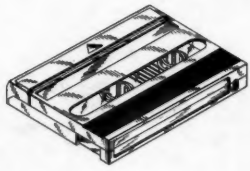


304,580
MAGNETIC TAPE CASSETTE
Haruyuki Enomoto, Yamato, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 27, 1986, Ser. No. 879,371
Claims priority, application Japan, Jan. 31, 1986, 61-3244
Term of patent 14 years
U.S. Cl. D14—121



304,581
MAGNETIC TAPE CASSETTE
Hiroshi Nakaizumi, Fort Lee, N.J., assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 10, 1986, Ser. No. 883,937
Claims priority, application Japan, Jan. 22, 1986, 61-1940
Term of patent 14 years
U.S. Cl. D14—121

304,582
MAGNETIC TAPE CASSETTE
Hiroshi Nakaizumi, Fort Lee, N.J., assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 10, 1986, Ser. No. 883,938
Claims priority, application Japan, Jan. 22, 1986, 61-1939
Term of patent 14 years
U.S. Cl. D14—121



304,583
MAGNETIC TAPE CASSETTE
Hiroshi Nakaizumi, Fort Lee, N.J., assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 10, 1986, Ser. No. 884,039
Claims priority, application Japan, Jan. 22, 1986, 61-1938
Term of patent 14 years
U.S. Cl. D14—121

304,584

REEL FOR A MAGNETIC TAPE CASSETTE

Kenichi Kano, Higashi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,870
Claims priority, application Japan, Feb. 24, 1987, 62-6869
Term of patent 14 years
U.S. Cl. D14—122

304,585

REEL FOR A MAGNETIC TAPE CASSETTE

Kenichi Kano, Higashi-Utaru, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,871
Claims priority, application Japan, Feb. 24, 1987, 62-6871
Term of patent 14 years
U.S. Cl. D14—122

304,586

LOUDSPEAKER

Tommyca Freadman, Taipei, Taiwan, and John F. Castagna, Milford, Pa., assignors to Sparkomatic Corporation, Milford, Pa.

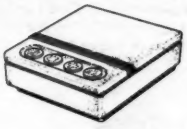
Filed Nov. 25, 1987, Ser. No. 125,443
Term of patent 14 years
U.S. Cl. D14—114

304,587

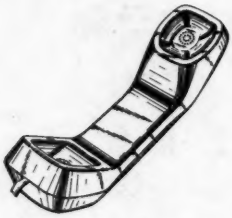
TELEPHONE DIALER ADJUNCT

David C. Danielson, New Canaan, Conn.; James J. Hartmann, Indianapolis, Ind.; John N. McGarvey, Drexel Hill, Pa.; Alvin R. Tilley, Red Bank, N.J., and John M. Wuerz, Indianapolis, Ind., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

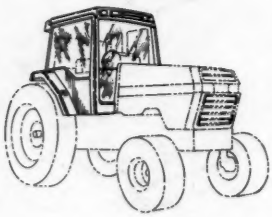
Filed Sep. 21, 1988, Ser. No. 247,458
Term of patent 14 years
U.S. Cl. D14—244



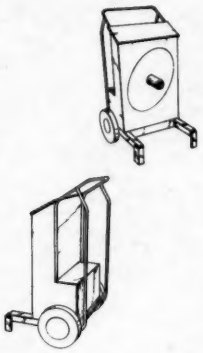
304,588
TELEPHONE HANDSET
Gus E. Desbarats, Putney, England, assignor to British Telecommunications public limited company, Great Britain
Filed May 13, 1988, Ser. No. 193,643
Claims priority, application United Kingdom, Nov. 13, 1987, 1046341
Term of patent 14 years
U.S. Cl. D14—248



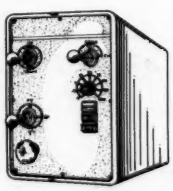
304,589
TRACTOR CAB
Ralph C. Lanphere, Racine, Wis., and Gregg C. Montgomery, Hinsdale, Ill., assignors to J. I. Case Company, Racine, Wis.
Filed Aug. 19, 1987, Ser. No. 73,202
Term of patent 14 years
U.S. Cl. D15—30



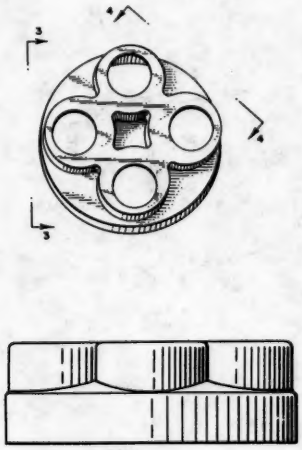
304,590
CONDUIT AND TUBE BENDER HOUSING
Larry G. Adleman, Rockford, and Vernon W. Wanner, Belvidere, both of Ill., assignors to Greenlee Textron, Inc., Rockford, Ill.
Filed Jun. 26, 1986, Ser. No. 879,235
Term of patent 14 years
U.S. Cl. D15—123



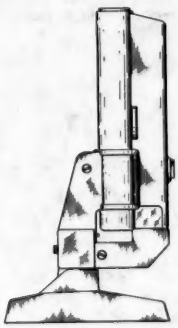
304,591
CONTROL FOR A SPINDLE HEAD
Robert L. Anderson, Boulder, Colo., assignor to Robotool Ltd., Broomfield, Colo.
Filed Apr. 18, 1986, Ser. No. 855,773
Term of patent 14 years
U.S. Cl. D15—138



304,592
PROTECTIVE COVER FOR A ROTATABLE TURRET ASSEMBLY AND OBJECTIVES OF AN INVERTED MICROSCOPE
Paul A. Hoogesteger, Penfield, N.Y., assignor to Cambridge Instruments, Inc., Cheektowaga, N.Y.
Filed Apr. 9, 1987, Ser. No. 36,391
Term of patent 14 years
U.S. Cl. D16—131



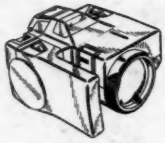
304,593
MICROSCOPE
Steven E. Hilko, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 10, 1985, Ser. No. 786,294
Term of patent 14 years
U.S. Cl. D16—131

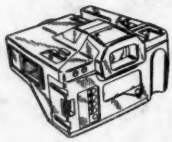


304,594
CAMERA LENS
Masato Yamamoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 8, 1987, Ser. No. 1,490
Claims priority, application Japan, Aug. 20, 1986, 61-32588
Term of patent 14 years
U.S. Cl. D16—134

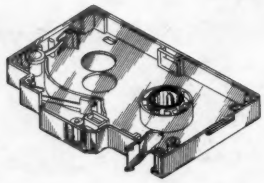
304,595
COMBINED VIDEO TAPE RECORDER AND CAMERA
Takanori Nishiyama, Koganei; Makoto Fukatsu, Kokubunji; Yuichi Kosukegawa, Chofu; Yukinobu Ichikawa, Tachikawa, and Shigeru Ichimura, Ibaragi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,521
Claims priority, application Japan, Jan. 7, 1987, 62-39
Term of patent 14 years
U.S. Cl. D16—202

304,596
CAMERA
Tetsuya Goto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Nov. 26, 1986, Ser. No. 935,570
Claims priority, application Japan, May 26, 1986, 61-020014
Term of patent 14 years
U.S. Cl. D16—217

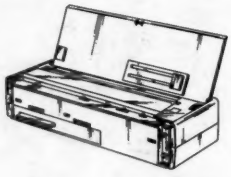




304,597
INK RIBBON CASSETTE
Sachie Sakurai, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 13, 1987, Ser. No. 72,621
Claims priority, application Japan, Jan. 7, 1987, 62-178
Term of patent 14 years
U.S. Cl. D18—12

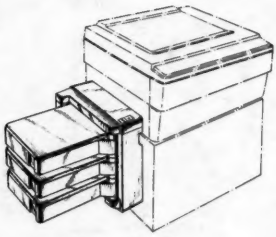


304,598
THERMAL PRINTER SPECIFICATION
Jane A. Joki, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 16, 1986, Ser. No. 819,951
Term of patent 14 years
U.S. Cl. D18—13

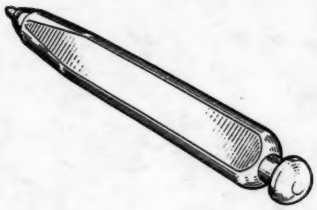


304,599
MOTOR DRIVEN IMPRINTER
Mark Cunnane, Clontarf, and Richard P. Delaney, Portmarnock, both of Ireland, assignors to Security Imprinter Corporation, Walkersville, Md.
Filed Sep. 23, 1986, Ser. No. 911,084
Claims priority, application Ireland, May 30, 1986, 165/86
Term of patent 14 years
U.S. Cl. D18—14

304,600
MULTI-LEVEL SHEET FEEDER
Tsutomu Takano, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan
Filed Jun. 16, 1986, Ser. No. 875,362
Claims priority, application Japan, Dec. 18, 1985, 60-52657
Term of patent 14 years
U.S. Cl. D18—42

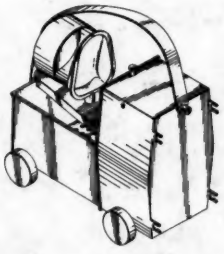


304,601
PEN
Björn M. Alskog, Hajdeby, S-620 23 Romakloster, Sweden
Filed Jul. 29, 1986, Ser. No. 891,730
Claims priority, application Sweden, Jan. 29, 1986, 86-0212
Term of patent 14 years
U.S. Cl. D19—49

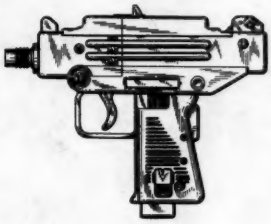


304,602
SIMULATIVE BALLOON
Mary G. McHugh, 201 Friedrichs Ave., Metairie, La. 70005
Filed Aug. 19, 1987, Ser. No. 87,244
Term of patent 14 years
U.S. Cl. D21—84

304,603
TOY CAR
Zin-Way Wen, No. 50-2, Alley 22, Lane 994, Kung Yen Rd., Tainan, Taiwan
Filed Dec. 7, 1987, Ser. No. 130,333
Term of patent 14 years
U.S. Cl. D21—124



304,604
TOY GUN
Yung W. Fan, Kowloon, Hong Kong, assignor to Mee Tung Manufacturing Company Limited, Kowloon, Hong Kong
Filed Nov. 4, 1987, Ser. No. 116,754
Claims priority, application United Kingdom, May 15, 1987, 1,042,210
Term of patent 14 years
U.S. Cl. D21—147

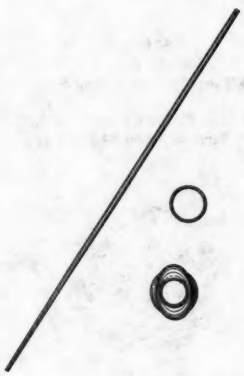


304,605
TOY BEAR
Donald D. McKay, Jr., 1509 North Ave., W., Missoula, Mont. 59801
Filed Aug. 5, 1986, Ser. No. 893,371
Term of patent 14 years
U.S. Cl. D21—159

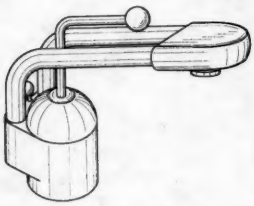
304,606
GOLF BALL
Wen-Shown Lo, 4 Tung Pei Street, Feng Yuan City, Taichung Hsien, Taiwan
Filed May 20, 1986, Ser. No. 865,053
Term of patent 14 years
U.S. Cl. D21—205

304,607
GOLF TEE
Robert D. Bagg, 387 Chestnut St., Oneonta, N.Y. 13820
Filed Oct. 3, 1986, Ser. No. 916,034
Term of patent 14 years
U.S. Cl. D21—208

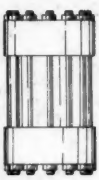
304,608
SKI POLE SHAFT
Gary Filice, Moorpark, Calif., assignor to Reflex Sport Products, Inc., Salt Lake City, Utah
Filed Jul. 8, 1987, Ser. No. 71,042
Term of patent 14 years
U.S. Cl. D21—230



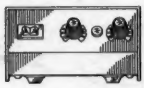
304,609
FAUCET WITH A ROTATABLE LEVER FOR A WASH BOWL
Bethany Lathrop, Los Angeles, Calif., assignor to Aloys F. Dornbracht GmbH & Co. KG, Muhle, Fed. Rep. of Germany
Filed Jan. 28, 1986, Ser. No. 823,372
Claims priority, application France, Jul. 29, 1985, 85 3654
Term of patent 14 years
U.S. Cl. D23—238

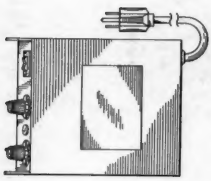


304,610
HIGH-PRESSURE CONTAINMENT VESSEL
Robert M. Conaway, Columbus, Ohio, assignor to Vital Force, Inc., Columbus, Ohio
Filed Feb. 12, 1987, Ser. No. 14,523
Term of patent 14 years
U.S. Cl. D23—207



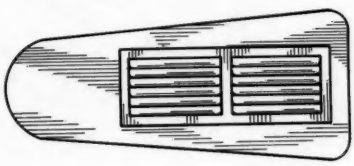
304,611
LABORATORY HEATER
Lawrence W. Stalec, Franklin Park, Ill., assignor to Lab-Line Instruments, Inc., Melrose Park, Ill.
Filed Mar. 30, 1987, Ser. No. 32,390
Term of patent 14 years
U.S. Cl. D23—314





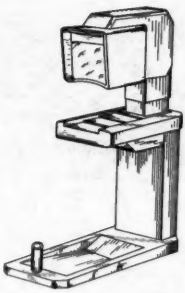
304,612
LASER SMOKE PARTICULATE/ODOR FILTER UNIT FOR USE IN SURGICAL ENVIRONMENTS
Wyman H. Stackhouse, Manhattan Beach, and Ian M. Williamson, Redondo Beach, both of Calif., assignors to W. Stackhouse Associates, Inc., El Segundo, Calif.
Filed Jan. 12, 1987, Ser. No. 2,185
Term of patent 14 years
U.S. Cl. D23—365

304,613
CEILING FAN BLADE
Paul Teal, 237 Mariner Cir., Cotuit, Mass. 02635
Filed Mar. 18, 1987, Ser. No. 27,505
Term of patent 14 years
U.S. Cl. D23—413

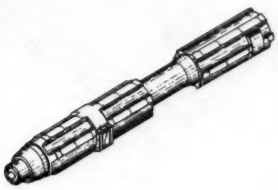


304,614
BENCH FOR PHYSIOTHERAPEUTICAL TREATMENT
Rolf Guttormsen, N, Hjellegt. 28, 3700 Skien, Norway
Filed Sep. 23, 1986, Ser. No. 910,746
Claims priority, application Norway, May 13, 1986, 67297
Term of patent 14 years
U.S. Cl. D24—3

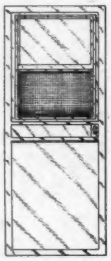
304,615
EYEWEAR PATIENT MEASURING STATION
Richard Fischer, Offenbach-Burgel, Fed. Rep. of Germany, assignor to Eyemetrics-Systems AG, Chur, Switzerland
Filed Nov. 18, 1986, Ser. No. 932,484
Claims priority, application Fed. Rep. of Germany, May 28, 1986, URA717/86
Term of patent 14 years
U.S. Cl. D24—17



304,616
MEDICAMENT INJECTOR
Kenneth W. Dunlap, Plymouth, and David Bardwell, Minnetonka, both of Minn., assignors to Derata Corporation, Minneapolis, Minn.
Filed Apr. 30, 1987, Ser. No. 44,520
Term of patent 14 years
U.S. Cl. D24—24

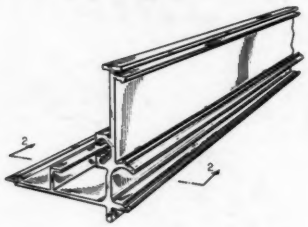


304,617
SELF STORING SECURITY STORM DOOR
Harold E. Werthman, Denver, Colo., assignor to All-Weather Industries, Inc., Denver, Colo.
Filed Jul. 11, 1988, Ser. No. 216,986
Term of patent 14 years
U.S. Cl. D25—48

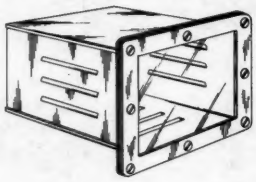


304,618
DECORATIVE GLASS PANEL
B. Jeremiah Shaffer, Worthington, Ohio, assignor to Pease Industries, Inc., Fairfield, Ohio
Filed Jul. 7, 1986, Ser. No. 882,816
Term of patent 14 years
U.S. Cl. D25—104

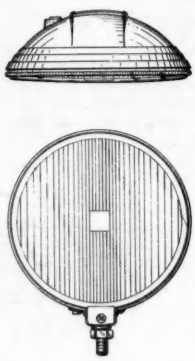
304,619
EXTRUSION FOR USE IN THE CONSTRUCTION OF A FLOOR OF A MOTOR LORRY
Philip K. Hockney, Smithfield, Australia, assignor to Hockney Pty. Limited, Smithfield, Australia
Filed Feb. 10, 1986, Ser. No. 828,017
Term of patent 14 years
U.S. Cl. D25—119



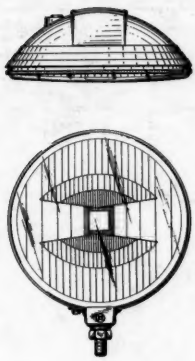
304,620
ABOVE GROUND POOL LIGHT
Tom Marcucci, 206 Old York Rd., Yardville, N.J. 08620
Filed May 23, 1986, Ser. No. 866,614
Term of patent 14 years
U.S. Cl. D26—24



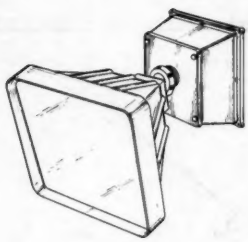
304,621
AUXILIARY HEADLAMP FOR MOTOR VEHICLES
Gerd Schmidt, Velbert, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany
Filed Mar. 15, 1988, Ser. No. 168,732
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, MR588
Term of patent 14 years
U.S. Cl. D26—36



304,622
AUXILIARY HEADLAMP FOR MOTOR VEHICLES
Gerd Schmidt, Velbert, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany
Filed Mar. 15, 1988, Ser. No. 168,733
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, MR588
Term of patent 14 years
U.S. Cl. D26—36



304,623
FLOOD LIGHT
James E. Roulstone, Spring, Tex., assignor to Innovative Controls, Inc., Houston, Tex.
Filed Jun. 24, 1987, Ser. No. 65,712
Term of patent 14 years
U.S. Cl. D26—63



304,624
ADJUSTABLE WALL LAMP
Michele De Lucchi, Milan, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Jul. 6, 1987, Ser. No. 70,833
Claims priority, application Italy, Jan. 8, 1987, 20427/87[U]
The portion of the term of this patent subsequent to Aug. 8, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—65

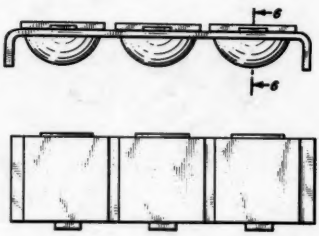
304,625
PIPE
Yutaka Katayama, Tokyo, Japan, assignor to Aruman Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 29, 1988, Ser. No. 174,937
Term of patent 14 years
U.S. Cl. D27—163

304,626
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster; David E. Auslander, Yardley, and Wayne M. Grim, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Dec. 21, 1987, Ser. No. 136,155
The portion of the term of this patent subsequent to Jun. 20, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—2

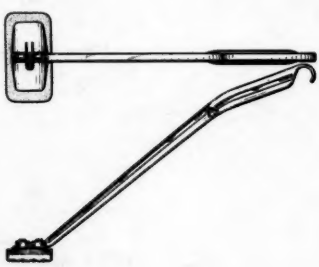
304,627
ELECTRIC HAIR CLIPPER
Kazuyoshi Yonesawa, Suita, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Apr. 4, 1987, Ser. No. 81,168
Claims priority, application Japan, Feb. 16, 1987, 62-5691
Term of patent 14 years
U.S. Cl. D28—53

304,628
CUTICLE STICK
Welester G. Alvarado, Los Angeles, Calif., assignor to Joico Laboratories, Inc., City of Industry, Calif.
Filed Oct. 27, 1987, Ser. No. 113,711
Term of patent 14 years
U.S. Cl. D28—57

304,629
COSMETIC CASE
Welester G. Alvarado, Los Angeles, Calif., assignor to Joico Laboratories, Inc., City of Industry, Calif.
Filed Oct. 27, 1987, Ser. No. 113,716
Term of patent 14 years
U.S. Cl. D28—76



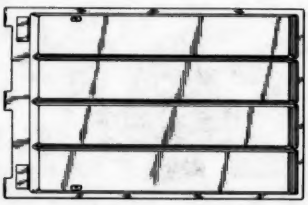
304,630
SPONGE MOP FOR CLEANING TUBS, TILE OR THE LIKE
David A. Jones, Dayton, and William J. O'Neil, Jr., Cincinnati, both of Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Jul. 31, 1987, Ser. No. 80,375
Term of patent 14 years
U.S. Cl. D32—40



304,631
TRASH BAG RETAINING AND TRANSPORTING CART
Steven J. McCarville, 2921 Pleasant St., West Des Moines, Iowa 50265
Filed Feb. 9, 1987, Ser. No. 12,644
Term of patent 14 years
U.S. Cl. D34—5

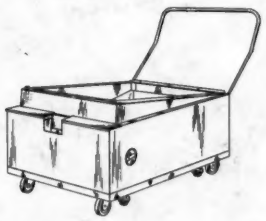
304,632
COVERED TRASH CAN HOLDER
Gerald P. Skalka, Washington, D.C., assignor to Victor Stanley, Inc., Dunkirk, Md.
Filed May 28, 1987, Ser. No. 58,025
Term of patent 14 years
U.S. Cl. D34—6

304,633
TRASH CONTAINER LID
Craig V. Taylor, 8924 Enfield Ave., Northridge, Calif. 91325
Filed Dec. 14, 1987, Ser. No. 132,134
Term of patent 14 years
U.S. Cl. D34—11



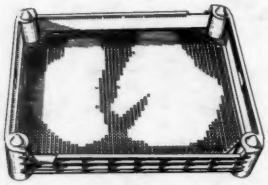
304,634
SIDE-LOADING DISH AND TRAY CART
Ronald C. Banko, North Wales, and Robert H. Nattress, Shavertown, both of Pa., assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.
Filed Sep. 18, 1987, Ser. No. 98,661
Term of patent 14 years
U.S. Cl. D34—14

304,635
CART
William H. Barrett, Woodstock; Joseph A. Gregory, Kingston; Lisa M. Mohr, and David L. Schaum, both of Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 3, 1986, Ser. No. 926,473
Term of patent 14 years
U.S. Cl. D34—19

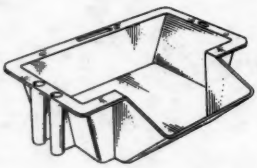


304,636
VENTILATING COVER FOR CONTAINER
Seo Y. Jun, 1-1205, Hongsil Apartment, 79 Samsung-Dong, Kangnam-Ku, Seoul, Rep. of Korea
Filed Jan. 27, 1986, Ser. No. 823,042
Claims priority, application Rep. of Korea, Sep. 6, 1985, 12619/85
Term of patent 14 years
U.S. Cl. D34—28

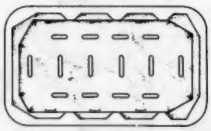
304,637
CRATE
Jean-Marie Chabot, St. Damien, Canada, assignor to Les Industries Provinciales Limitée, St. Damien, Canada
Filed Aug. 11, 1987, Ser. No. 83,804
Term of patent 14 years
U.S. Cl. D34—40

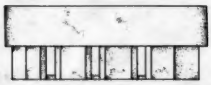


304,638
SUPPLY TRAY
Ann M. Ireland, 1931 Wilcox Ave., Hollywood, Calif. 90068
Filed Sep. 8, 1986, Ser. No. 905,050
Term of patent 14 years
U.S. Cl. D34—40



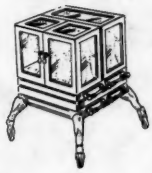
304,639
STACKABLE TRAY
Victor G. Davis, West Kingston, England, assignor to Foam Fabricators Ltd., St. Louis, Mo.
Filed Dec. 12, 1986, Ser. No. 941,264
Term of patent 14 years
U.S. Cl. D34—40

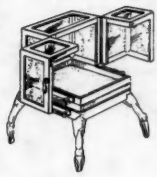




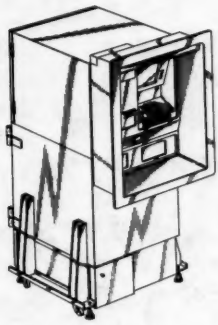
304,640
BASKET OR SIMILAR ARTICLE
Matthew S. Newman, P.O. Box 46, Scotts Road, New Braintree, Mass. 01531
Filed Aug. 29, 1986, Ser. No. 902,337
Term of patent 14 years
U.S. Cl. D34—44

304,641
CREMATION URN DISPLAY STAND
Marcel J. Bourassa, P.O. Box 3249, Kamloops, B.C., Canada V2C 6B8
Filed Oct. 1, 1986, Ser. No. 914,592
Claims priority, application Canada, Apr. 4, 1986, 04-04-86-1
Term of patent 14 years
U.S. Cl. D99—5



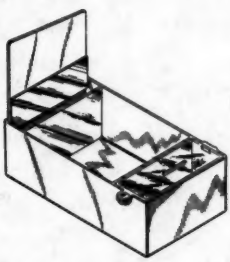


304,642
AUTOMATED TELLER MACHINE
Yoshinori Kakiuchi, Kawasaki, Japan, and Luigi Di Benedetto, Los Angeles, Calif., assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 28, 1987, Ser. No. 7,827
Term of patent 14 years
U.S. Cl. D99—28



304,643
COIN ORGANIZER
Donald G. Sloan, 17263 Halsted St., Northridge, Calif. 91325
Filed Dec. 29, 1986, Ser. No. 947,555
Term of patent 14 years
U.S. Cl. D99—34

304,644
COMBINED CONFECTIONERY TRAY, ADVERTISING HOLDER AND DONATION BOX
Charles E. Silcox, Rte. #3, Box 499, Proctorville, Ohio 45669
Filed Jul. 16, 1986, Ser. No. 886,508
Term of patent 14 years
U.S. Cl. D99—36



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF NOVEMBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Frejborg, Frey, 4,880,540, Cl. 210-413.000.

A. O. Smith Corporation: *See*—
Stubbe, James S.; Chevalier, James L.; and Pow, Edwin C., 4,879,801, Cl. 29-455.100.

A/S Ferrosan: *See*—
Watjen, Frank; and Engelstoft, Mogens, 4,880,799, Cl. 514-211.000.

A.T.B. S.P.A.: *See*—
Bordignon, Abramo, 4,881,146, Cl. 360-132.000.

Aardelite Holding B. V.: *See*—
Spanjer, Jacobs J.; and Rademaker, Pieter D., 4,880,582, Cl. 264-82.000.

Aarestad, Jerome K., to Sundstrand Corporation. Centrifugal liquid pump. 4,880,352, Cl. 415-182.100.

Aasen, Steven M.; and Oxman, Joel D., to Minnesota Mining and Manufacturing Company. Method for priming hard tissue. 4,880,660, Cl. 427-2.000.

Abbott, David I.: *See*—
Jones, David; and Abbott, David I., 4,881,252, Cl. 379-38.000.

Abbott Laboratories: *See*—
Callison, Oscar H., 4,880,912, Cl. 530-361.000.
Chu, Daniel T.; Rosen, Terry J.; and Cooper, Curt S., 4,880,814, Cl. 514-300.000.

Abboud, George E.; Such, Christopher H.; Horley, Susan M.; and Waters, Julian A., to Imperial Chemical Industries PLC. Acryloxy-containing compounds. 4,880,931, Cl. 544-316.000.

Abe, Masaaki: *See*—
Haranoya, Tomoji; Motegi, Toshio; and Abe, Masaaki, 4,879,969, Cl. 118-638.000.

Abe, Shunji: *See*—
Shigemoto, Hiromi; Abe, Shunji; and Yamamoto, Akio, 4,880,589, Cl. 264-216.000.

Abe, Susan S.: *See*—
Guffey, Timothy B.; Abe, Susan S.; Talkington, Sherry R.; and Mijac, Marko D., 4,880,657, Cl. 426-601.000.

Abe, Toshiaki: *See*—
Okita, Kumakazu; Abe, Toshiaki; and Kiriyama, Masaru, 4,880,577, Cl. 264-22.000.

Abegg, Frank, III; and Gemmell, Stephen G., to Datac, Inc. Turbine monitoring apparatus. 4,881,184, Cl. 364-551.010.

Abel, Heinz; Guth, Christian; and Berendt, Hans-Ulrich, to Ciba-Geigy Corporation. Antifoams for aqueous systems and their use. 4,880,564, Cl. 252-321.000.

Aberson, James A., Jr.; DeVeau, George F.; and Yasinski, Kenneth M., to American Telephone & Telegraph Company, AT&T Bell Laboratories. Optical fiber connector and methods of making. 4,880,291, Cl. 350-96.210.

Abrevaya, Hayim: *See*—
Imai, Tamotsu; and Abrevaya, Hayim, 4,880,764, Cl. 502-326.000.

Abrutyn, Eric S., to Dow Corning Corporation. Lattice-entrapped composition. 4,880,617, Cl. 424-501.000.

ACF Industries, Incorporated: *See*—
Schmidt, Kenneth D., 4,880,148, Cl. 222-195.000.

Ackeret, Peter, to Licinvest AG. Cyclic rearrangement apparatus for stacked rectangular sheets. 4,879,825, Cl. 40-513.000.

Ackerman, John P.; and Miller, William E., to United States of America, Energy. Electrorefining process and apparatus for recovery of uranium and a mixture of uranium and plutonium from spent fuels. 4,880,506, Cl. 204-1.500.

Ackermann, Norbert: *See*—
Knecht, Heinz; and Ackermann, Norbert, 4,880,086, Cl. 188-299.000.

Actel Corporation: *See*—
Mohsen, Amr M.; Hamdy, Esmat Z.; and McCollum, John L., 4,881,114, Cl. 357-54.000.

Adachi, Eiichi: *See*—
Kumazawa, Tetsuo; Shimaoka, Makoto; Fukuda, Kazuyuki; and Adachi, Eiichi, 4,880,290, Cl. 350-96.200.

Adachi, Naotomo: *See*—
Kaiwa, Ryoichi; Kudo, Michiyoshi; Kobayashi, Keiki; Suganuma, Yuichiro; and Adachi, Naotomo, 4,881,258, Cl. 379-58.000.

Adachi, Tetsuro: *See*—
Matsuda, Masami; Funabashi, Kiyomi; Nishi, Takashi; Komori, Itaru; Baba, Tsutomu; Yusa, Hideo; Uchida, Shunsuke; Adachi, Tetsuro; Ohsumi, Katsumi; and Sato, Tomohiro, 4,880,595, Cl. 376-313.000.

Adair, Henry, to Memorex Corporation. Tape reel. 4,880,180, Cl. 242-71.800.

Adam, Jean-Marie, to Ciba-Geigy Corporation. Cationic azo dyes containing 2(p-aminophenyl)oxazolo [4,5-b]pyridines and similar compounds as diazo components. 4,880,916, Cl. 534-606.000.

Adams, Richard W.: *See*—
Lindsey, Hiram E.; and Adams, Richard W., 4,880,058, Cl. 166-289.000.

Adler, Robert; Fogelson, Mark; and Kaplan, Sam, to Zenith Electronics Corporation. Touch control arrangement for graphics display apparatus having saw reflectors of frit composition. 4,880,665, Cl. 427-126.300.

Adlon, Daniel T.; and Folk, Kenneth F., to AMP Incorporated. Selective wire feed for a plurality of wires. 4,879,934, Cl. 83-76.900.

Adolfsson, Rune, to SKF Nova AB. Device for use in explosive welding of two overlapping tubular or annular elements. 4,880,153, Cl. 228-2.500.

Adolph Coors Company: *See*—
Vischer, Peter, 4,879,815, Cl. 33-293.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Vuillet, Alain E.; Philippe, Jean J.; and Desopper, Andre , 4,880,355, Cl. 416-228.000.

Ago, Hideo: *See*—
Otsubo, Kazunari; Ezoe, Motonobu; Ago, Hideo; and Yamamoto, Koji, 4,880,896, Cl. 528-196.000.

Agostinelli, John A.: *See*—
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 4,880,770, Cl. 505-1.000.

Aguilar, Josephine: *See*—
Loria, Adrian; and Aguilar, Josephine, 4,880,465, Cl. 106-20.000.

Aguilera, Angel R. Sail airfoil device. 4,879,961, Cl. 114-102.000.

Ahlberg, Carl S.; Chamberlin, Davis W.; Buahong, Jerold W.; Oliveira, Robert J.; and Kolpe, Vasant V., to Minnesota Mining and Manufacturing Company. Hearing aid ear piece having disposable compressible polymeric foam sleeve. 4,880,076, Cl. 181-130.000.

Ahlstone, Arthur G., to Cameron Iron Works USA, Inc. Tool for running structures in a well. 4,880,061, Cl. 166-348.000.

Aihara, Toshiharu, to Casio Computer Co., Ltd. Compact electronic apparatus with a refresh unit for a dynamic type memory. 4,881,205, Cl. 365-222.000.

Aihara, Yoshihiko: *See*—
Fukahori, Hidehiko; Suzuki, Masayuki; and Aihara, Yoshihiko, 4,881,092, Cl. 354-152.000.

AIL Corporation: *See*—
Day, Eric; Aubin, Jean Paul; and Peyrot, Jan, 4,879,985, Cl. 123-501.000.

Air Products and Chemicals, Inc.: *See*—
Bauman, Bernard D., 4,880,879, Cl. 525-130.000.
Howells, Roger A.; Stoner, George H.; and Stockunas, Joseph, 4,880,162, Cl. 239-406.000.
Mehta, Rajendra K., 4,880,675, Cl. 428-35.700.

Air-Vac Engineering Company, Inc.: *See*—
Lasto, Clifford S., 4,880,358, Cl. 417-174.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hasegawa, Hiromi; and Ishiguro, Toshiaki, 4,880,091, Cl. 192-3.300.
Hida, Tsuneo; Takizawa, Sumio; Ishii, Hakumi; Kegasa, Hideo; and Izawa, Minoru, 4,881,020, Cl. 318-626.000.
Nakamura, Ryuji, 4,880,095, Cl. 192-58.00B.

Aisin-Warner Kabushiki Kaisha: *See*—
Ando, Masahiko, 4,880,090, Cl. 192-3.300.

Ajinomoto Co., Inc.: *See*—
Tabohashi, Tatsuru; Sakurai, Takao; Higuchi, Ryoichi; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, 4,880,561, Cl. 252-299.610.

Akagawa, Minoru; Naoi, Satoshi; and Fukumoto, Heijiro, to Intelmatec Corporation. Disk carrier. 4,880,518, Cl. 204-298.000.

Akao, Yasushi: *See*—
Sasaki, Hisao; Terada, Matsuaki; Matsui, Susumu; Kawakita, Kenji; Kashio, Jiro; Baba, Shiro; Akao, Yasushi; and Okochi, Toshio, 4,881,167, Cl. 364-200.000.

Aki, Shinji: *See*—
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,880,806, Cl. 514-249.000.

Akimoto, Mamoru: *See*—
Hojo, Takeshi; Yamamoto, Kanshi; Kawada, Shinichi; Murabayashi, Kazushige; Akimoto, Mamoru; and Fukano, Michio, 4,879,918, Cl. 74-5.470.

Akiyama, Yoshinobu; Yoshihashi, Sakashi; and Sakauchi, Iwao, to Kyodo Milk Industry Co., Ltd. Processing tofu or dough for processed tofu to result in meat-like texture. 4,880,659, Cl. 426-656.000.

Akiyoshi, Mitsuo: *See*—
Hirai, Kazumi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; and Hori, Ichiroh, 4,880,952, Cl. 219-10.55B.

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Akshic Memories Corporation: *See*—
Scott, John C.; Li, Eric K.; Washburn, Hudson A.; and Viswanathan, Nal T., 4,880,514, Cl. 204-192.200.

Akzo America Inc.: *See*—
Fesman, Gerald, 4,880,844, Cl. 521-107.000.

Al-Siouñi, Habib. Method and device for disinfecting biological fluids and container for same. 4,880,602, Cl. 422-28.000.

Alard, Michel: *See*—
Pommier, Daniel; and Alard, Michel, 4,881,241, Cl. 375-38.000.

Albert-Frankenthal AG: *See*—
Herb, Rolf, 4,879,791, Cl. 29-148.40D.

Alberty, Thomas: *See*—
Goeckler, Heinz; and Alberty, Thomas, 4,881,222, Cl. 370-70.000.

Albouy, Pierre: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.

Albrektsson, Tomas; and Aspenberg, Per, to Nobelpharma AB. Bone ingrowth chamber. 4,880,006, Cl. 128-630.000.

Alcan International Limited: *See*—
Holroyd, Nigel J. H.; Hepples, Warren; and Scamans, Geoffrey M., 4,880,709, Cl. 428-654.000.

Alcatel N.V.: *See*—
Debuyscher, Pierre L., 4,881,223, Cl. 370-77.000.
Kaltbeitzel, Gunter; Klein, Michael; Renner, Martin; and Wolk, Joachim, 4,881,229, Cl. 371-20.400.
Meschkat, Peter; and Zanzig, Jurgen, 4,881,262, Cl. 379-402.000.

Alcon Laboratories, Inc.: *See*—
Dastoli, Frank R.; Senkowski, Bernard Z.; Wagener, Dieter W.; Bogdanffy, George H.; and Vin, Gaurang R., 4,880,581, Cl. 264-39.000.

Aldissi, Mahmoud, to United States of America, Energy. Water-soluble conductive polymers. 4,880,508, Cl. 204-59.00R.

Allcock, Harry R.; Austin, Paul E.; and Kwon, Sukky, to Research Corporation Technologies, Inc. Water-soluble phosphazene polymers having pharmacological applications. 4,880,622, Cl. 424-78.000.

Allec, Josiane: *See*—
Grollier, Jean-Francois; Allec, Josiane; Fourcadier, Chantal; Rosenbaum, Georges; and Darmenton, Patrick, 4,880,621, Cl. 424-74.000.

Allen, George S.: *See*—
Schohe, Rudolf; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,880,802, Cl. 514-222.200.

Allen, John V.; Put, Berend; and Boraston, Geoff W. Fluidized bed reactor with two zone combustion. 4,879,958, Cl. 110-245.000.

Allen, William M.; Sansom, Bernard F.; Wilson, Alan D.; Prosser, Havard J.; and Groffman, David M., to National Research Development Corporation. Sustained release composition. 4,880,628, Cl. 424-605.000.

Allergan, Inc.: *See*—
Ting, Albert C.; Willis, Timothy R.; Christ, F. Richard; Bacich, Steven R.; Pettit, Dean K.; Van Gent, Stanley L.; and Day, Jeffrey C., 4,880,426, Cl. 623-6.000.

Allied Colloids Limited: *See*—
Farrar, David; Flesher, Peter; Skinner, Malcolm; Clarke, John; Marshall, David; and Hawe, Malcolm, 4,880,858, Cl. 524-60.000.

Allied-Signal Inc.: *See*—
Cordova, Colleen W.; and Cordova, David S., 4,880,704, Cl. 428-395.000.
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., 4,880,871, Cl. 525-43.000.
Strangman, Thomas E.; and Solfest, Patricia A., 4,880,614, Cl. 428-623.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,880,483, Cl. 149-6.000.

Almering, Antonius F. J., to U.S. Philips Corporation. Switching arrangement. 4,881,012, Cl. 315-209.00R.

Almozaffar, Sam: *See*—
Packer, Julian P.; and Almozaffar, Sam, 4,880,993, Cl. 290-2.000.

Alps Electric Co., Ltd.: *See*—
Soma, Masahiro; and Tanaka, Shinya, 4,881,065, Cl. 340-710.000.

Alter, S.A.: *See*—
Sunkel, Carlos; Fay de Casa Juana, Miguel; Dorrego, Fernando; Pando, Basilio; Alvarez-Builla, Julio; Vaquero, Juan J.; Galera, Carlos; and Vazquez, Maria L., 4,880,894, Cl. 548-152.000.

Altman, Lawrence J.; Choi, Byung C.; and Karsner, Grant C., to Mobil Oil Corporation. Method for control of visbreaker severity. 4,880,748, Cl. 436-60.000.

Aluminum Company of America: *See*—
Khosah, Robinson P.; Novak, John W.; Weaver, Douglas G.; Fraser-Mills, Karen R.; and Burr, Richard R., 4,880,543, Cl. 210-635.000.

Alvarez-Builla, Julio: *See*—
Sunkel, Carlos; Fay de Casa Juana, Miguel; Dorrego, Fernando; Pando, Basilio; Alvarez-Builla, Julio; Vaquero, Juan J.; Galera, Carlos; and Vazquez, Maria L., 4,880,894, Cl. 548-152.000.

Alvers, Gary M. Crankcase supercharged 4 stroke, 6 cycle engine. 4,879,974, Cl. 123-51.00A.

Amagai, Yoshimi: *See*—
Murofushi, Toshiaki; Nakazawa, Hiroshi; Oyamada, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; and Ohya, Yasuhiro, 4,880,719, Cl. 430-106.600.

Amano, Yoshikai: *See*—
Koyama, Kazuo; and Amano, Yoshikai, 4,881,273, Cl. 455-161.000.

Amdahl Corporation: *See*—
Thomas, Jeffrey A.; Robinson, Theodore S.; Ertl, Robert A.; and Christensen, Harold F., r., 4,881,163, Cl. 364-200.000.

American Cyanamid Company: *See*—
Child, Ralph G.; Bitha, Panayota; Hlavka, Joseph J.; and Lin, Yang-I, 4,880,790, Cl. 514-184.000.
Moore, Sewell T.; and Brevard, William, 4,880,498, Cl. 162-164.600.

American National Can Company: *See*—
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.

American Screen Printing Equipment Company: *See*—
Bubley, Henry J., 4,879,948, Cl. 101-114.000.

American Standard Inc.: *See*—
Murdoch, Ian S., 4,879,858, Cl. 52-741.000.

American Telephone and Telegraph Company: *See*—
Gauss, Edward J., 4,880,202, Cl. 248-676.000.
Saltzberg, Burton R., 4,881,059, Cl. 341-70.000.

American Telephone & Telegraph Company, AT&T Bell Laboratories: *See*—
Aberson, James A., Jr.; DeVeau, George F.; and Yasinski, Kenneth M., 4,880,291, Cl. 350-96.210.
Cava, Robert J.; and Sunshine, Steven A., 4,880,771, Cl. 505-1.000.
Lipari, Dominic T., 4,880,396, Cl. 439-578.000.

Amersham International PLC: *See*—
Sadler, Peter J.; Harding, Charles T.; Kelly, James D.; and McEwen, Andrew B., 4,880,007, Cl. 128-653.000.

Amoco Corporation: *See*—
Hunt, Mack W., 4,880,550, Cl. 252-33.000.
Thompson, Glenn R.; and Breitbart, Yuri J., 4,881,166, Cl. 364-200.000.

AMP Incorporated: *See*—
Adlon, Daniel T.; and Folk, Kenneth F., 4,879,934, Cl. 83-76.900.
Beamenderfer, Robert E.; Long, William B.; and Shuey, John R., 4,880,388, Cl. 439-108.000.
Dawson, Andrew J., Jr.; Farrar, John C.; Pirc, Douglas J.; and Taylor, Atalee S., 4,880,397, Cl. 439-620.000.
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,880,386, Cl. 439-68.000.
Nicholas, Vincent; and Siwinski, Paul P., 4,879,809, Cl. 29-860.000.
Sergeant, Ronald G.; and VanDerStuyf, Allen F., 4,879,810, Cl. 29-861.000.

Ampex Corporation: *See*—
Hathaway, Mark A., 4,881,145, Cl. 360-130.240.
Olson, Robert N., 4,879,786, Cl. 16-341.000.

Andco Environmental Processes, Inc.: *See*—
Uhrich, Kevin D., 4,880,510, Cl. 204-131.000.

Andermann, Guy; Spittler, Joseph; Zilliox, Patricia; and Mergel, Dominique, to Laboratoires, P.O.S. Hydrogen peroxide disinfecting system for contact lenses. 4,880,601, Cl. 422-28.000.

Anderson, Clifford J.: *See*—
Bland, Linden; and Anderson, Clifford J., 4,880,062, Cl. 166-371.000.

Anderson, Dennis C. Nesting preventer for bottle bases. 4,880,126, Cl. 215-100.00R.

Anderson, Donald. Circular saw blade having removable teeth. 4,879,936, Cl. 83-842.000.

Anderson Strathclyde PLC: *See*—
Herridge, Frederick J., 4,880,247, Cl. 279-79.000.

Ando, Masahiko, to Aisin-Warner Kabushiki Kaisha. Hydraulic controlling system for lockup clutches. 4,880,090, Cl. 192-3.300.

Andros, Andrew A.; and Campana, Thomas J., Jr., to Telefind Corp. Paging system with dynamically programmable reception frequencies. 4,881,073, Cl. 340-825.440.

Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Cephalosporins. 4,880,795, Cl. 514-202.000.

Angus, Julian G.: *See*—
Hollingsworth, Fred, III; and Angus, Julian G., 4,879,849, Cl. 52-10.000.

Anis, Aziz Y. Flexible posterior chamber lens. 4,880,427, Cl. 623-6.000.

ANT Nachrichtentechnik GmbH: *See*—
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Anzeveno, Peter B.; Daniel, John K.; Creemer, Laura J.; and Liu, Paul S., to Merrell Dow Pharmaceuticals Inc. Process for hydrolyzing 2,6-dideoxy-2,6-iminoheptononitrile derivatives using trifluoroacetic acid and dinitrogen tetroxide. 4,880,917, Cl. 536-17.400.

Anzinger, Hermann: *See*—
Wahle, Bernd; Anzinger, Hermann; Ziche, Horst; and Schinski, Erhard, 4,880,898, Cl. 528-272.000.

Aoki, Masaaki; Tani, Mayumi; Kamiyama, Masayuki; and Asai, Kiyotsugu, to Mitsui Toatsu Chemicals, Inc. β-amino-β-propiolactam derivative and moisture curable polyurethane composition thereof. 4,880,869, Cl. 524-773.000.

Aoki, Satoshi: *See*—
Imoto, Katsuyuki; Takase, Akihiko; Takai, Atsushi; Aoki, Satoshi; Yoshiya, Tsutomu; and Yamada, Shoji, 4,880,289, Cl. 350-96.180.

Aonuma, Shigeo: *See*—
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Aoyama, Hiroshi: *See*—
Kondo, Susumu; Moriya, Tetsuo; and Aoyama, Hiroshi, 4,880,886, Cl. 526-80.000.

Apfel, Steven L., to Hughes Aircraft Company. Low pressure reaction control propulsion system for a spacecraft. 4,880,185, Cl. 244-135.00B.

Appleton Papers Inc.: *See*—
Miller, Robert E.; Vervacke, Steven L.; Bahowick, Timothy J.; and Glanz, Kenneth D., 4,880,766, Cl. 503-212.000.

Appleyard, Michael: *See*—
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Aqua Process, Inc.: *See*—
Staley, Charles M.; and Cornish, Verle E., 4,880,568, Cl. 252-548.000.

Arabian American Oil Company: *See*—
Lee, Charles M., 4,880,335, Cl. 405-158.000.

Arai, Tomohisa: *See*—
Tanaka, Shigenobu; and Arai, Tomohisa, 4,881,169, Cl. 364-200.000.

Arakawa, Mitsuaki: *See*—
Kaufman, Leon; Arakawa, Mitsuaki; McCarten, Barry M.; Fehn, John H.; and Krasnor, Stephen, 4,881,034, Cl. 324-318.000.

Araki, Shoji: *See*—
Takeuchi, Kenichi; Saito, Shin; Araki, Shoji; and Nakayama, Atsushi, 4,881,253, Cl. 379-54.000.

Arch, Jonathan R., to Beecham Group p.l.c. Method for administering ethanolamine derivatives to livestock. 4,880,834, Cl. 514-567.000.

Arco Chemical Technology, Inc.: *See*—
Le-Khac, Bi, 4,880,868, Cl. 524-549.000.

Arie, Tsutomu: *See*—
Kijima, Toshio; Tezuka, Tokuya; Doi, Yoji; Yamashita, Shuiichi; Namba, Shigetoh; and Arie, Tsutomu, 4,880,745, Cl. 435-253.300.

Arita, Yoshihiro: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,880,857, Cl. 523-205.000.

Armer, Thomas A.: *See*—
Kinneberg, Peter A.; Armer, Thomas A.; van Breen, Adriaan W.; Barton, Roger E. C.; and Klei, Ebel, 4,880,904, Cl. 528-392.000.

Armstrong Patents Co. Limited: *See*—
Janes, Geoffrey G., 4,880,087, Cl. 188-322.160.

Arnold, Robert G.: *See*—
Hoffmann, Michael R.; Arnold, Robert G.; and Stephanopoulos, Gregory, 4,880,740, Cl. 435-168.000.

Aro Corporation, The: *See*—
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Arsura, Emilio: *See*—
Capizzi, Amedeo; Arsura, Emilio; and Spinelli, Pia, 4,879,837, Cl. 43-124.000.

Artos Engineering Company: *See*—
Wollermann, Kenneth; and Gudmestad, Ragnar, 4,879,926, Cl. 81-9.510.

Aruga, Masayoshi: *See*—
Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, 4,880,823, Cl. 514-356.000.

Asada Kabushiki Kaisha: *See*—
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Asada, Katsuhiko: *See*—
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, 4,881,196, Cl. 364-900.000.

Asada, Toshiyuki; Kubo, Seitoku; Nakamura, Shinya; Kinoshita, Masafumi; and Kuroda, Takaaki, to Toyota Jidosha Kabushiki Kaisha. Transaxle casing for automatic transmission. 4,879,921, Cl. 74-467.000.

Asahi Corporation: *See*—
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Asahi Glass Company, Ltd.: *See*—
Kobayashi, Shigeyoshi; Yaba, Susumu; and Takigawa, Tomoya, 4,880,163, Cl. 239-422.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,880,767, Cl. 503-217.000.
Kajihara, Junichi; Kiyota, Takao; and Hayashi, Hiroshi, 4,880,915, Cl. 530-413.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Masato; Nakajima, Masahiro; and Yamanaka, Toshimasa, 4,881,098, Cl. 354-403.000.

Asahi Research Corporation: *See*—
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Asahi, Satoru: *See*—
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Asai, Kiyotsugu: *See*—
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Asami, Katsuhiko: *See*—
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Asano, Hajime: *See*—
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, 4,881,196, Cl. 364-900.000.

Asano, Katsuhiko: *See*—
Okamura, Katsutoshi; Esaki, Yasuo; Matsuzawa, Koichi; and Asano, Katsuhiko, 4,880,650, Cl. 426-330.400.

Asaoka, Teruo: *See*—
Kuwabara, Youhei; Asaoka, Teruo; Yoshioka, Shogo; and Sugiyama, Haruki, 4,880,509, Cl. 204-129.200.
Kuwabara, Youhei; Asaoka, Teruo; and Iwasaki, Yasuhiro, 4,880,516, Cl. 204-224.00M.

ASEA Aktiebolag: *See*—
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Asea Brown Boveri AB: *See*—
Eriksson, Rolf; Hammarlund, Gudmar; and Sundqvist, Lars-Erik, 4,880,395, Cl. 439-507.000.

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Ashland Oil, Inc.: *See*—
Bowers, Robert B.; and Chookazian, Mark, 4,880,580, Cl. 264-26.000.
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Semura, Norio; Tsuchida, Masumi; and Shimamura, Yoshihiro, 4,879,803, Cl. 29-598.000.

Aso, Toshiyuki; and Hosoda, Hiroshi, to Fanuc Ltd. Wire-cut electrical discharge machine with electric shock preventer. 4,880,957, Cl. 219-69.120.

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Albrektsson, Tomas; and Aspenberg, Per, 4,880,006, Cl. 128-630.000.

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Gauss, Edward J., 4,880,202, Cl. 248-676.000.

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Scholefield, John; and Johnston, Robert, 4,880,149, Cl. 222-207.000.

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Gaulard, Michel, 4,880,048, Cl. 164-342.000.

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Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.
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Engel, Gunter; Krempl, Peter W.; List, Helmut; Posch, Uwe; and Nitsch, Alfred, 4,881,003, Cl. 310-311.000.
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Haggerty, John A., 4,880,319, Cl. 384-215.000.
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Ting, Albert C.; Willis, Timothy R.; Christ, F. Richard; Bacich, Steven R.; Pettit, Dean K.; Van Gent, Stanley L.; and Day, Jeffrey C., 4,880,426, Cl. 623-6.000.
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Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.
Baehr, Bernd D.; Rall, Ulrich; van Delden, Hildegard; and Lillotte, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Silicate-and magnesium-free stabilizer mixtures. 4,880,566, Cl. 252-389.220.
Bagwell, James T.; and Howe, Blair E., to Cimco, Inc. Scrub brush package. 4,880,111, Cl. 206-209.100.
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Bailey, Frank, to Magnet PLC. Emergency window system. 4,879,842, Cl. 49-141.000.
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Frost, Phillip, 4,880,813, Cl. 514-282.000.
Baker, Don R.; Brownell, Keith H.; and Kezerian, Charles, to Stauffer Chemical Company. Fungicidal carbanilates. 4,880,831, Cl. 514-485.000.
Baker, Gregory G.; and Boyle, Edward F., to Roboptek, Inc. Wafer centration device. 4,880,348, Cl. 414-783.000.
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Nelson, John A.; and Stout, Gregg W., 4,880,056, Cl. 166-51.000.
Baker, Ross G., Jr.; Calfee, Richard V.; Haluska, Edward A.; and Whistler, Stephen J., to Intermedics, Inc. Implantable cardiac stimulator with automatic gain control and bandpass filtering in feedback loop. 4,880,004, Cl. 128-419.0PG.
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Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Pyrophoric composition. 4,880,483, Cl. 149-6.000.
Baldus, Heinz-Dieter: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; and Schroder, Norbert, 4,880,172, Cl. 241-101.200.
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Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.
Balog, Stephen; and Hiestand, Everett N., to Upjohn Company, The. Tablet press. 4,880,373, Cl. 425-149.000.
Bamer, Franz, to Robert Bosch GmbH. Apparatus for shielding and protecting an air flow rate meter disposed in the intake tube of an internal combustion engine from air column fluctuations. 4,879,898, Cl. 73-118.200.
Bamforth, Charles W.; and Cope, Roy, to Bass Public Limited Company. Beer and other beverages and their manufacture. 4,880,643, Cl. 426-16.000.
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Nakagawa, Susumu; Mitomo, Ryuji; and Ushijima, Ryosuke, 4,880,797, Cl. 514-206.000.
Barcomb, Lyle B.; and El-Hindi, Lawrence, to Filter Tech Inc. Edge seal for liquid filtration apparatus. 4,880,538, Cl. 210-401.000.
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Barker, Howard A.: *See*—
Rirsch, Eric A.; and Barker, Howard A., 4,880,467, Cl. 106-85.000.
Barlow, Darren E.: *See*—
Lew, Chel W.; and Barlow, Darren E., 4,880,646, Cl. 426-93.000.
Barmag, AG: *See*—
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Barnes Group Inc.: *See*—
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,879,808, Cl. 29-845.000.
Baroid Technology, Inc.: *See*—
Jelsma, Henk H., 4,880,067, Cl. 175-107.000.
McMahan, James M., Jr.; and Harper, Roland G., Jr., 4,880,025, Cl. 137-1.000.
Barone, Joseph P., to Millipore Corporation. Crystal growth process for preparing inorganic dynamic membranes. 4,880,544, Cl. 210-639.000.
Barr, Philip J.: *See*—
Burke, Rae L.; Rosenberg, Steven; Shuster, Jeffrey R.; Tekamp-Olson, Patricia; Valenzuela, Pablo D. T.; and Barr, Philip J., 4,880,734, Cl. 435-68.000.
Barron, Mark B., to IXYS Corporation. DV/DT of power MOSFETS. 4,881,106, Cl. 357-23.800.
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Bartels, James I.; Patton, Paul B.; Kidder, Kenneth B.; and Gaskell, Alfred J., to Honeywell Inc. Method and apparatus for monitoring and calibrating damper position. 4,880,376, Cl. 431-12.000.
Bartko, John: *See*—
Smith, Richard C.; Bartko, John; and Fero, Arnold H., 4,881,247, Cl. 376-257.000.
Barton, Roger E. C.: *See*—
Kinneberg, Peter A.; Armer, Thomas A.; van Breen, Adriaan W.; Barton, Roger E. C.; and Klei, Ebel, 4,880,904, Cl. 528-392.000.
BASF Aktiengesellschaft: *See*—
Dix, Johannes P.; Etzbach, Karl-Heinz; Mayer, Udo; and Sens, Ruediger, 4,880,769, Cl. 503-227.000.
Hub, Hans-Henning; Simon, Georg N.; Heinz, Gerhard; Ziegler, Walter; and Sadlowski, Juergen, 4,880,876, Cl. 525-67.000.
Klimesch, Roger G.; Bleckmann, Gerhard; Farwerck, Karl-Peter; Goertz, Hans-Helmut; and Schlemmer, Lothar, 4,880,585, Cl. 264-141.000.
Kolassa, Dieter; Keil, Michael; Schirmer, Ulrich; Theobald, Hans; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,880,456, Cl. 71-88.000.
Leyrer, Reinhold J.; and Neumann, Peter, 4,880,718, Cl. 430-58.000.
Pfohl, Sigberg; Kroener, Michael; Hartmann, Heinrich; and Denzinger, Walter, 4,880,497, Cl. 162-135.000.
Seppelt, Wolfgang; Hofmeister, Peter; and Kuenast, Christoph, 4,880,837, Cl. 514-594.000.
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BASF K&F Corporation: *See*—
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Bass Public Limited Company: *See*—
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Basset, Frederic: *See*—
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Bassett, Max: *See*—
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Batchelor, Paul S. Collapsible barrier for vehicular traffic. 4,880,332, Cl. 404-6.000.
Battelle Memorial Institute: *See*—
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Baubles, Richard C., to Jacobson Mfg. Co., Inc. Wire-wrap connector. 4,880,400, Cl. 439-722.000.
Baum, Thomas H.; Comita, Paul B.; and Jackson, Robert L., to International Business Machines Corporation. Process for interconnecting thin-film electrical circuits. 4,880,959, Cl. 219-121.850.
Bauman, Bernard D., to Air Products and Chemicals, Inc. Abrasion resistant composite material and process for making the same. 4,880,879, Cl. 525-130.000.
Baumgartner, Eugen: *See*—
Kagi, Rudolf; and Baumgartner, Eugen, 4,879,887, Cl. 68-16.000.

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Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,880,795, Cl. 514-202.000.
Blank, Heinz U.; Langenfeld, Norbert; and Heydkamp, Wolfgang, 4,880,576, Cl. 562-828.000.
Dietz, Wolfgang; Gerken, Rudolf; Lailach, Gunter; and Clasen, Peter, 4,880,446, Cl. 55-71.000.
Lindel, Hans; Ingendoh, Axel; Berschauer, Friedrich; de Jong, Anno; and Scheer, Martin, 4,880,840, Cl. 514-645.000.
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurrsen, Klaus, 4,880,932, Cl. 544-320.000.
Schohe, Rudolf; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,880,802, Cl. 514-222.200.
Tork, Leo; Vogt, Hans-Gunter; and Heins, Ferdinand, 4,880,673, Cl. 427-412.000.
Zander, Hans-Gunter; Bornefeld, Horst; and Holle, Bernd-Michael, 4,880,169, Cl. 241-5.000.

Bayer, Heiner: *See*—
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Baylor College of Medicine: *See*—
Moake, Joel L.; Phillips, Martin D.; McIntire, Larry V.; and Hellums, Jesse D., 4,880,788, Cl. 514-150.000.

Bayman, Hal: *See*—
Gibson, Jeffrey W.; and Bayman, Hal, 4,881,085, Cl. 346-75.000.

BBC Brown Boveri AG: *See*—
Hirth, Michael; and Wiegart, Norbert, 4,880,685, Cl. 423-210.000.

Beach, David E., to Eastman Kodak Company. Film cassette. 4,880,179, Cl. 242-71.100.

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Beaulieu, Nicholas J. Clapboard slide gauge. 4,879,818, Cl. 33-646.000.

Beaupre, Serge. Load hoisting assembly particularly for boats. 4,880,345, Cl. 414-137.900.

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Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, 4,881,269, Cl. 382-8.000.

Becerra-Novoa, Jorge O.: *See*—
Martinez-Vera, Enrique R.; and Becerra-Novoa, Jorge O., 4,880,458, Cl. 75-35.000.

Becka, Michael M.; and Walega, William, to International Shoe Machine Corporation. Heel molder. 4,879,778, Cl. 12-146.00D.

Becker, Rainer: *See*—
Kolassa, Dieter; Keil, Michael; Schirmer, Ulrich; Theobald, Hans; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,880,456, Cl. 71-88.000.

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Arch, Jonathan R., 4,880,834, Cl. 514-567.000.
Robinson, Jeffery H.; and Dodd, Ian, 4,880,776, Cl. 514-2.000.

Bein, Thomas W. Rigid support structure for single screw compressors. 4,880,367, Cl. 418-107.000.

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Sollinger, Hans-Peter; Meinecke, Albrecht; Weiss, Hans; and Beisswanger, Rudolf, 4,880,671, Cl. 427-356.000.

Beliveau, Robert N.: *See*—
Dionne, Roland A., 4,879,963, Cl. 114-363.000.

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Wedel, Gregory L., 4,880,502, Cl. 162-359.000.

Benedict, Roger J.; and Forlow, John K., to Roper Whitney Company. Press with movable workpiece support carrier. 4,879,894, Cl. 72-405.000.

Benetti, Ermanno: *See*—
Credali, Lino; Mulas, Carlo; Benetti, Ermanno; and Lunardon, Gianflavio, 4,880,847, Cl. 521-157.000.

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Wassmuth, Georg; Ruppmich, Karl; Seiler, Erhard; Gausepohl, Hermann; and Benker, Klaus, 4,880,875, Cl. 525-67.000.

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Bennett Automotive Technology Pty., Ltd.: *See*—
Bennett, John R. McC., 4,879,975, Cl. 123-52.00M.

Bennett, John E.; Novak, Donald S.; and Mitchell, Thomas A., to ELTECH Systems Corporation. Catalytic polymer electrode for cathodic protection and cathodic protection system comprising same. 4,880,517, Cl. 204-196.000.

Bennett, John R. McC., to Bennett Automotive Technology Pty., Ltd. Alcohol fuel operation conversion means for internal combustion engines. 4,879,975, Cl. 123-52.00M.

Bennett, Robert P.; and Ozaki, Kunimitsu. Combined refrigerator and microwave oven with timed overload protection. 4,880,954, Cl. 219-10.55M.

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Falconer, Thomas H.; and Benson, William H., 4,880,106, Cl. 198-763.000.

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Beremand, Marian N.; and Black, Patricia J., to United States of America, Agriculture. Fusarium sporotrichioides mutant strain capable of producing both dideacetylcalonectrin and deacetylcalonectrin. 4,880,747, Cl. 435-254.000.

Berends, Jos. Method of making chewing bones for pets. 4,880,642, Cl. 426-5.000.

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Abel, Heinz; Guth, Christian; and Berendt, Hans-Ulrich, 4,880,564, Cl. 252-321.000.

Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., to Shop-Vac Corporation. Portable electric blower. 4,880,364, Cl. 417-423.100.

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Knoblauch, Karl; Tarnow, Ferdinand; and Heimbach, Heinrich, 4,880,765, Cl. 502-432.000.

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Berne, Robert M.: *See*—
Mentzer, Robert M., Jr.; Ely, Stephen W.; Lasley, Robert D.; and Berne, Robert M., 4,880,783, Cl. 514-46.000.

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Berry, Marilee G.; and Berry, Dickey J., 4,880,315, Cl. 383-39.000.

Berry, Marilee G.; and Berry, Dickey J. Roll-up carrying bag with adjustable compartments. 4,880,315, Cl. 383-39.000.

Berry, Robert W., III, to Audiosone, Inc. Combined audible and visual alarm system. 4,881,058, Cl. 340-326.000.

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Lindel, Hans; Ingendoh, Axel; Berschauer, Friedrich; de Jong, Anno; and Scheer, Martin, 4,880,840, Cl. 514-645.000.

Bertagnoli, Leopoldo, to Orizio Paolo S.p.A. Universal double-cylinder, multi-yarn-feed circular knitting machine. 4,879,884, Cl. 66-14.000.

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Puigcerver, Luis; Shimirak, Gerald; and Berth, Jorgen, 4,880,676, Cl. 428-35.700.

Bhattacharyya, Manoj K.; Davidson, Robert J.; and Gill, Hardayal S., to Hewlett-Packard Company. Compensated magneto-resistive read head. 4,881,143, Cl. 360-113.000.

Bickford, Allan M. Anesthetic vaporizer. 4,879,997, Cl. 128-200.210.

Bicron Corporation: *See*—
Johnston, Joseph G., 4,880,981, Cl. 250-369.000.

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Vom Braucke, Hans; Vom Braucke, Manfred; and Westerwelle, Dieter, 4,880,192, Cl. 248-110.000.

Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, to French Limited Company - Centaure Robotique. Automatic method of optically scanning a two-dimensional scene line-by-line and of electronically inspecting patterns therein by "shape-tracking". 4,881,269, Cl. 382-8.000.

Biological Resistance, Inc.: *See*—
Yabrov, Alexander A.; and Roitberg, Michael, 4,880,417, Cl. 604-355.000.

Bioxy International, Ltd.: *See*—
Gordon, Gilbert, 4,880,638, Cl. 424-662.000.

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Knoll, Jozsef; Birkmayer, Walter; Kalloy, Katalin; Marton, Jeno; and Ecsery, Zoltan, 4,880,833, Cl. 514-565.000.

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Blake, Anthony: *See*—
Holzner, Gunter; Kittner, Peter; and Blake, Anthony, 4,880,649, Cl. 426-302.000.

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Blank, Heinz U.; Langenfeld, Norbert; and Heydkamp, Wolfgang, to Bayer Aktiengesellschaft. Acid halides, a process for their preparation. 4,880,576, Cl. 562-828.000.

Blank, Itzhak, to Haifa Chemicals Limited. Method for the manufacture of slow-release fertilizers. 4,880,455, Cl. 71-28.000.

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Klimesch, Roger G.; Bleckmann, Gerhard; Farwerck, Karl-Peter; Goertz, Hans-Helmut; and Schlemmer, Lothar, 4,880,585, Cl. 264-141.000.

Bloch, Christopher J., to Naylor Industrial Services, Inc. Method and apparatus for steam flow venting incorporating air educting means. 4,880,447, Cl. 55-94.000.

Blocker, Erich, to Hoechst Aktiengesellschaft. Polyester molding composition, process for its preparation and its use. 4,880,860, Cl. 524-94.000.

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Bloomquist, Marvin G.; and Warner, Barry N., to Mobil Oil Corporation. Method of processing converted mode seismic data. 4,881,209, Cl. 367-52.000.

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Boan, Bobby J.: *See*—
Sanborn, James A.; and Boan, Bobby J., 4,880,570, Cl. 252-512.000.

Board of Governors of Wayne State University, The: *See*—
Sheyman: Vladimir, 4,880,053, Cl. 165-104.260.

Board of Regents, The University of Texas System: *See*—
Georghegan, William D., 4,880,751, Cl. 436-518.000.
Leiman, Basil C.; Butler, Bruce D.; Katz, Jeffrey; and Salzarulo, Henry H., 4,879,999, Cl. 128-207.140.

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Moss, Christopher T.; Tufts, Timothy A.; and Bock, Robert S., 4,880,845, Cl. 521-114.000.
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Kaspar, Klaus P., 4,880,731, Cl. 435-7.000.

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Davert, Edward J.; and McCowin, Peter D., 4,879,875, Cl. 60-588.000.
Nakamura, Gary D.; and Stephenson, Jerry D., 4,880,050, Cl. 165-41.000.
Wiggins, Richard F., 4,880,101, Cl. 198-403.000.

Boesten, Wilhelmus H. J.: *See*—
Kerkhoffs, Pieter L.; and Boesten, Wilhelmus H. J., 4,880,737, Cl. 435-106.000.

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Dastoli, Frank R.; Senkowski, Bernard Z.; Wagener, Dieter W.; Bogdanffy, George H.; and Vin, Gaurang R., 4,880,581, Cl. 264-39.000.

Boge AG: *See*—
Knecht, Heinz; and Ackermann, Norbert, 4,880,086, Cl. 188-299.000.

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Jerlich, Werner J.; Kugler, Alfred; Kaiserfeld, Hans; Schulhofer, Anton; and Zechner, Werner, 4,880,481, Cl. 148-325.000.

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Booth, Rodney I.; Edwards, David W.; Wrigley, Colin W.; and Orth, Robert A., to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for the determination of viscosity. 4,879,897, Cl. 73-59.000.

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Termine, Enrico J.; Faystritsky, Nicolai A.; and Borden, Dennis M., 4,880,862, Cl. 524-373.000.

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Woudsma, Roberto; Chong, David C. H.; McSweeney, Brian T.; Borgers, Stephanus M. C.; and Habraken, Egidius A. P., 4,881,192, Cl. 364-725.000.

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Zander, Hans-Gunter; Bornefeld, Horst; and Holle, Bernd-Michael, 4,880,169, Cl. 241-5.000.

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Nitzinger, Karl; Gerl, Josef; Steiner, Herbert; and Hess, Helmut, 4,880,955, Cl. 219-10.55R.

Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, to International Business Machines Corporation. Sealing and stress relief layers and use thereof. 4,880,684, Cl. 428-209.000.

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Hall, Garth O.; and Tengler, Harvey N., 4,880,201, Cl. 248-575.000.

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Langa, John M.; Boswell, Michael J.; and Littleton, Kermit R., 4,880,167, Cl. 239-542.000.

Bothner, Jakob, to Zinser Textilmaschinen GmbH. Apparatus for positioning a ring rail of a textile machine. 4,879,872, Cl. 57-137.000.

Bottomley, Paul A.; Roemer, Peter B.; Edelstein, William A.; and Mueller, Otward M., to General Electric Company. Method of, and apparatus for, NMR spectroscopic metabolite imaging and quantification. 4,881,032, Cl. 324-309.000.

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Matrozza, Mark A.; Leverone, Marianne F.; and Boudreaux, Donald P., 4,880,743, Cl. 435-252.400.

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Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, 4,881,269, Cl. 382-8.000.

Boulanger, Alain: *See*—
Auneau, Gisele; and Boulanger, Alain, 4,881,048, Cl. 331-14.000.

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Bowden, William L., to Duracell Inc. Method for preparing non-aqueous electrolytes. 4,880,714, Cl. 429-197.000.

Bowen, Wesley G.: *See*—
Ferre, F. Budd; Sims, Rowell; Bowen, Wesley G.; and Kesler, Vibert L., 4,880,026, Cl. 137-234.600.

Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne; Hubbs, John C.; and Foster, Charles H., to Eastman Kodak Company. Combinations having synergistic growth hormone releasing activity and methods for use thereof. 4,880,778, Cl. 514-12.000.

Bowers, Robert B.; and Chookazian, Mark, to Ashland Oil, Inc. Reusable plastic drum container assembly and process for refitting such plastic drum container assembly. 4,880,580, Cl. 264-26.000.

Bowles, Cecil A.: *See*—
Keller, Lewis C.; and Bowles, Cecil A., 4,880,653, Cl. 426-549.000.

Bowlin, David A.; and Seyman, Michael J., to Halliburton Services. Waste solidification composition and methods. 4,880,468, Cl. 106-98.000.

Boyesen, Eyvind, to Performance Industries, Inc. Reed valve mechanism for engines. 4,879,976, Cl. 123-651.000.

Boyle, Edward F.: *See*—
Baker, Gregory G.; and Boyle, Edward F., 4,880,348, Cl. 414-783.000.

Boys, John T., to University of Auckland. Method and/or apparatus for controlling the motor speed of an electric AC motor and/or a method of determining torque. 4,881,022, Cl. 318-800.000.

BPB Industries Public Limited Company: *See*—
Jones, Philip E.; and Highet, Robert, 4,879,856, Cl. 52-403.000.

Braatz, Paul O.; and Efron, Uzi, to Hughes Aircraft Company. Double-Schottky diode liquid crystal light valve. 4,881,110, Cl. 357-30.000.

Brackmann, Walter H., Jr.; Van Gelder, Cornelius A.; and Halushka, Roman A., to Hughes Aircraft Company. Pressure compensated intermodule towed array connector. 4,880,390, Cl. 439-204.000.

Bradford, Bruce P.: *See*—
Graves, William H., Jr.; Wallace, Gary W.; Bradford, Bruce P.; Carpenter, Carolyn R.; Smith, Kenneth W.; and Toft, Howard C., 4,880,018, Cl. 131-375.000.

Bradley, Richard S., to Weigh-Tronix, Inc. Electronic bathroom scale. 4,880,069, Cl. 177-211.000.

Braendle, Jurg G.; and Wolfgang, Saur, to Gurit Essex AG. Vehicle window and a method of manufacturing the window. 4,879,853, Cl. 52-208.000.

Brakenhoff, Godefridus J., to Stitchting Voor De Techische Wetenschappen. Continuously variable microdiaphragm. 4,880,294, Cl. 350-269.000.

Brambilla, Silvio, to Sicam Societa' Italiana Cuscini A Molle S.p.A. Front seat for a motor vehicle having only two side doors. 4,880,268, Cl. 296-65.100.

Brandell, John T.; and Giroux, Richard L., to Halliburton Company. Sliding sleeve casing tool. 4,880,059, Cl. 166-332.000.

Branstetter, Ronald L.: *See*—
Jaeb, Jonathan P.; Gilstad, Dennis W.; and Branstetter, Ronald L., 4,880,304, Cl. 356-41.000.

Brassette, Duane J. Self-loading truck and tilt bed therefor. 4,880,346, Cl. 414-486.000.

Brault, Alfred F.; and Gray, John D., to Davidson Textron Inc. Method for producing a molded article having colored features. 4,880,588, Cl. 264-163.000.

Braun, Robert: *See*—
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Brauning, Egon, to Protoned B.V. Seat furniture. 4,880,272, Cl. 297-296.000.

Breitbart, Yuri J.: *See*—
Thompson, Glenn R.; and Breitbart, Yuri J., 4,881,166, Cl. 364-200.000.

Brell, Siegfried. Self-supporting tent. 4,880,024, Cl. 135-101.000.

Brennan, Thomas M.: *See*—
Brueck, Steven R. J.; Schaus, Christian F.; Osinski, Marek A.; McInerney, John G.; Raja, M. Yasin A.; Brennan, Thomas M.; and Hammons, Burrell E., 4,881,236, Cl. 372-45.000.

Brevard, William: *See*—
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Brewer, Henry E. Cranking board for gasoline powered hand tool. 4,880,198, Cl. 248-346.000.

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Bridgestone Corporation: *See*—
Yoshikawa, Masato; Kusano, Yukihiro; Naito, Kazuo; Honda, Toshio; and Hata, Tomonobu, 4,880,515, Cl. 204-192.120.

Brigham Young University: *See*—
Robins, Roland K.; and Cottam, Howard B., 4,880,784, Cl. 514-48.000.

Bright, James A. Fault detector. 4,881,028, Cl. 324-127.000.

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Haines, Derrick J.; and Marsh, Harry, 4,880,320, Cl. 384-215.000.

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Day, Roger A., 4,880,189, Cl. 244-214.000.

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Whitt, Steven, 4,881,243, Cl. 375-4.000.

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McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.

Britton, John, to Valor International Ltd.; and HBH Equipment Ltd. Control gear for high intensity gas discharge lighting. 4,881,011, Cl. 315-209.0SC.

Brockhaus, Jurgen: *See*—
Tolle, Karl-Heinz; Heinemann, Heinz-Walter; Brockhaus, Jurgen; and Fiebrich, Wolfgang, 4,879,785, Cl. 16-82.000.

Brockman, Lester H. Collapsible sawhorse. 4,880,080, Cl. 182-155.000.

Brogardh, Torgny; and Ovren, Christer, to ASEA Aktiebolag. Fiber-optic measuring apparatus using luminescent material. 4,880,972, Cl. 250-231.00R.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Company. Macrocyclic polyamine and polycyclic polyamine multifunctional lubricating oil additives. 4,880,923, Cl. 540-471.000.

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Bronshvatch, Efim: *See*—
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Bronson, Charles L., to Varel Manufacturing Company. Rotary drill bit locking mechanism. 4,880,068, Cl. 175-369.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Sasaki, Ryoichi, 4,880,321, Cl. 400-64.000.

Broussard, Robert, to Progressive Health & Fitness. Weight plate for exercise device. 4,880,229, Cl. 272-123.000.

Brown, Douglas P.: *See*—
Patterson, Jon M.; and Brown, Douglas P., 4,880,160, Cl. 239-167.000.

Brown, Neil D.: *See*—
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Baker, Don R.; Brownell, Keith H.; and Kezerian, Charles, 4,880,831, Cl. 514-485.000.

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Bruckmann, Gerhard: *See*—
Stenzel, Otto; Muller, Felix; Bruckmann, Gerhard; and Choudhury, Alok, 4,881,239, Cl. 373-70.000.

Brueck, Steven R. J.; Schaus, Christian F.; Osinski, Marek A.; McInerney, John G.; Raja, M. Yasin A.; Brennan, Thomas M.; and Hammons, Burrell E., to University of New Mexico. Wavelength-resonant surface-emitting semiconductor laser. 4,881,236, Cl. 372-45.000.

Bruggemann, Peter: *See*—
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Bryan, William J.; and Fuhrman, Nathan, to Combustion Engineering, Inc. Alloy coated fuel cladding. 4,880,597, Cl. 376-419.000.

Bryant, David M. T.: *See*—
Tang, Wai-Cheung; Cameron, Richard J.; and Bryant, David M. T., 4,881,051, Cl. 333-208.000.

Bryzek, Janusz: *See*—
Ramsey, Jeffery E.; Bryzek, Janusz; and Mallon, Joseph R., Jr., 4,879,903, Cl. 73-431.000.

Bubley, Henry J., to American Screen Printing Equipment Company. Press with automatic sheet transport mechanism. 4,879,948, Cl. 101-114.000.

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Buchler, Rene , 4,880,220, Cl. 269-71.000.

Buchler, Rene , to Buchler B-SET AG. Device for holding an object in a spatial position. 4,880,220, Cl. 269-71.000.

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Budzelaar, Petrus H. M.: *See*—
van Doorn, Johannes A.; Wife, Richard L.; and Budzelaar, Petrus H. M., 4,880,902, Cl. 528-392.000.

Bugnon, Philippe; Grubenmann, Arnold; Medinger, Bernhard; and Schaefle, Jean, to Ciba-Geigy Corporation. Organic pigments coated with metal oxides. 4,880,472, Cl. 106-493.000.

Buhren, Harald, to Robert Bosch GmbH. Arrangement for monitoring a computer system having two processors in a motor vehicle. 4,881,227, Cl. 371-9.000.

Bulatovic, Srdjan; and Salter, Robert S., to Falconbridge Limited. Separation of polymetallic sulphides by froth flotation. 4,880,529, Cl. 209-167.000.

Bullard, Edward M.: *See*—
Belmont, Kirk E.; Bullard, Edward M.; DiBiasi, Daniel J.; Forman, Edward W., Jr.; and McIntyre, David E., 4,880,316, Cl. 383-75.000.

Bundens, Robert G.; and Herbst, Joseph A., to Mobil Oil Corporation. Cracking catalyst. 4,880,787, Cl. 502-65.000.

Burdick, Brent A.; Wu, Tai-Wing; Hilborn, David A.; and Spayd, Richard W., to Eastman Kodak Company. Analytical element and its use in a whole blood hemoglobin assay. 4,880,749, Cl. 436-66.000.

Burgess, Dale L.: *See*—
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,879,808, Cl. 29-845.000.

Burgkhardt, Bertram: *See*—
Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, 4,880,986, Cl. 250-484.100.

Burk, Robert G. Tubular carrier pin. 4,880,108, Cl. 198-803.120.

Burke, Rae L.; Rosenberg, Steven; Shuster, Jeffrey R.; Tekamp-Olson, Patricia; Valenzuela, Pablo D. T.; and Barr, Philip J., to Chiron Corporation. Eukaryotic regulatable transcription. 4,880,734, Cl. 435-68.000.

Burks, Arthur W.: *See*—
Holland, John H.; and Burks, Arthur W., 4,881,178, Cl. 364-513.000.

Burlington Industries, Inc.: *See*—
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Burnett, Thomas W.; Clary, Thomas R.; Iannuzzelli, Vincent F.; and Kremer, Carl P., Jr., to Mallinckrodt, Inc. Shielding container for radioaerosol delivery apparatus. 4,880,989, Cl. 250-506.100.

Burns, Edward F.: *See*—
Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L., 4,880,211, Cl. 266-44.000.

Burr, Richard R.: *See*—
Khosah, Robinson P.; Novak, John W.; Weaver, Douglas G.; Fraser-Milla, Karen R.; and Burr, Richard R., 4,880,543, Cl. 210-635.000.

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Kelley, James L., 4,880,812, Cl. 514-272.000.

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Burrows, Bruce D. Reverse osmosis water purification system with improved pressure relief valve. 4,880,534, Cl. 210-130.000.

Burrows, Bruce D. Water supply station with multiple water storage reservoirs. 4,880,535, Cl. 210-181.000.

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Ahlberg, Carl S.; Chamberlin, Davis W.; Bushong, Jerold W.; Oliveira, Robert J.; and Kolpe, Vasant V., 4,880,076, Cl. 181-130.000.

Butler, Bruce D.: *See*—
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Butler, Jerry F.: *See*—
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BW-USA, Inc.: *See*—
Judkins, Ren, 4,880,044, Cl. 160-84.100.

Byer, Robert L.: *See*—
Fejer, Martin M.; and Byer, Robert L., 4,880,297, Cl. 350-355.000.

Byrne, Brian; and Lawter, Louise M. L., to Hercules Incorporated. Pineapple ketone carbonate derivatives. 4,880,641, Cl. 426-3.000.

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Caines, R. Scott: *See*—
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Calabrese, Joseph A.: *See*—
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Calderone, Nicholas: *See*—
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Caldwell, James R.: *See*—
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Caldwell, Janice D.; and Knox, Walter H., III, to Reynolds Metals Company. Barrier film. 4,880,697, Cl. 428-35.400.

Calfee, Richard V.: *See*—
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Calgon Corporation: *See*—
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Callison, Oscar H., to Abbott Laboratories. Dispersion and neutralization of acid casein. 4,880,912, Cl. 530-361.000.

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Tang, Wai-Cheung; Cameron, Richard J.; and Bryant, David M. T., 4,881,051, Cl. 333-208.000.

Campana, Thomas J., Jr.: *See*—
Andros, Andrew A.; and Campana, Thomas J., Jr., 4,881,073, Cl. 340-825.440.

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Scott, Donald S.; and Piskorz, Jan, 4,880,473, Cl. 127-37.000.

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Kataoka, Hiroyuki; and Kumakura, Tosiyuki, 4,881,013, Cl. 315-241.00P.
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Nishino, Tsutomu, 4,881,064, Cl. 340-709.000.
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Kilbride, Cuthbert J., 4,880,394, Cl. 439-404.000.

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Autrey, Bob, 4,880,245, Cl. 279-1.00R.

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Blake, Scott L.; Carthew, Millie A.; and Collins, Christopher G., 4,880,531, Cl. 210-169.000.

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Caruthers, Scott, to Dar Products Corporation. Exercise devices. 4,880,228, Cl. 272-122.000.

Casio Computer Co., Ltd.: *See*—
Aihara, Toshiharu, 4,881,205, Cl. 365-222.000.

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O'Dowd, James G.; Catalano, Anthony W.; Fortmann, Charles M.; and Lee, Ora J., 4,880,664, Cl. 427-109.000.

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Haraveth, Garry R.; Catterfeld, Robert J.; and Trasen, Benjamin, 4,880,536, Cl. 210-232.000.

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Cellini, John V.; Ronghi, Mario F.; and Geren, James G. Vacumm distillation system with spiralled cold coil. 4,880,504, Cl. 202-185.600.

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Chanzy, Henri D.; and Paillet, Michel, 4,880,469, Cl. 106-203.000.

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Shroot, Braham; Watts, Oliver; Gazith, Joseph; and Cavey, Marie-Therese, 4,880,941, Cl. 549-57.000.

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Pommier, Daniel; and Alard, Michel, 4,881,241, Cl. 375-38.000.

Centre National d'Etudes Spatiales: *See*—
Remondiere, Olivier; Bourquin, Patrick; and Pailler, Rene , 4,880,960, Cl. 219-273.000.

Cerberus AG: *See*—
Muller, Kurt; and Mahler, Hansjurg, 4,880,980, Cl. 250-353.000.

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Chambers, David C., to Minnesota Mining and Manufacturing Company. Article removal control system. 4,881,061, Cl. 340-568.000.
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Champion Chemicals, Inc.: *See*—
Naraghi, Ali R., 4,880,609, Cl. 423-226.000.
Champlin, Keith S. Electric battery testing device with automatic voltage scaling to determine dynamic conductance. 4,881,038, Cl. 324-426.000.
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Chang, Chin-Hsing, to UOP. Process for separating ketoses from alkaline-or pyridine-catalyzed isomerization products. 4,880,920, Cl. 536-127.000.
Chang, Ching H.: *See*—
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne; Hubbs, John C.; and Foster, Charles H., 4,880,778, Cl. 514-12.000.
Chang, Glenn E. C.: *See*—
Jones, Robert J.; and Chang, Glenn E. C., 4,880,584, Cl. 264-135.000.
Chang, Lien-Kuei: *See*—
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Chanzy, Henri D.; and Paillet, Michel, to Institut Textile de France; and Centre de Recherche Scientifique. Process for the preparation of a shapeable solution of cellulose in the presence of a tertiary amine oxide and an additive. 4,880,469, Cl. 106-203.000.
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Charles, Richard J.; and Gaddipati, Achuta R., to General Electric Company. Method of making a ferrite composite containing silver metallization. 4,880,599, Cl. 419-6.000.
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Chau, Albert W.; and Mercer, John E., to FlowMole Corporation. Homing technique for an in-ground boring device. 4,881,083, Cl. 342-459.000.
Chaussadas, Jean, to Mead Corporation, The. Multipack for cans incorporating plastics securing band. 4,880,115, Cl. 206-427.000.
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Chen, Samuel J., to Kendall Company, The. Adhesive tapes including same. 4,880,880, Cl. 525-163.000.
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Knecht, John A.; and Chenoweth, Darrell L., 4,881,270, Cl. 382-17.000.
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Kitchin, John; Cherry, Peter C.; Pipe, Adrian J.; Crame, Andrew J.; and Borthwick, Alan D., 4,880,801, Cl. 514-215.000.
Cheval, Benoit: *See*—
Pfeiffer, Pierre; Cheval, Benoit; and Sigwalt, Paul, 4,880,138, Cl. 220-320.000.
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Chicopee: *See*—
Ness, Irving S., 4,880,419, Cl. 604-368.000.
Chien, Wan S.: *See*—
Tseng, Su; and Chien, Wan S., 4,881,154, Cl. 362-102.000.
Chihiro, Masatoshi: *See*—
Uchida, Minoru; Morita, Seiji; Chihiro, Masatoshi; and Nakagawa, Kazuyuki, 4,880,815, Cl. 514-303.000.
Child, Ralph G.; Bitha, Panayota; Hlavka, Joseph J.; and Lin, Yang-I, to American Cyanamid Company. (Gem-heterocyclodimethanamine-N,N')platinum complexes. 4,880,790, Cl. 514-184.000.
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Knoll, Jozsef; Birkmayer, Walter; Kalloy, Katalin; Marton, Jeno; and Ecsery, Zoltan, 4,880,833, Cl. 514-565.000.
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Chio, Shiu-Shin. Method and apparatus for determining blood pressure and cardiovascular condition. 4,880,013, Cl. 128-681.000.
Chiong, Kaolin N.: *See*—
Moreau, Wayne M.; and Chiong, Kaolin N., 4,880,722, Cl. 430-192.000.
Chiron Corporation: *See*—
Burke, Rae L.; Rosenberg, Steven; Shuster, Jeffrey R.; Tekamp-Olson, Patricia; Valenzuela, Pablo D. T.; and Barr, Philip J., 4,880,734, Cl. 435-68.000.
Chiron, Paul J.; Watson, Kevin D.; and Shaw, Raymond W., to Comalco Aluminum Limited. Hot filter media. 4,880,541, Cl. 210-496.000.
Chiron-Werke GmbH & Co. KG: *See*—
Winkler, Hans-Henning; and Rutschle, Eugen, 4,879,802, Cl. 29-568.000.
Chisso Corporation: *See*—
Kitano, Kisei; Uchida, Manabu; Ushioda, Makoto; and Suzuki, Toshiharu, 4,880,562, Cl. 252-299.630.
Choi, Byung C.: *See*—
Altman, Lawrence J.; Choi, Byung C.; and Karsner, Grant C., 4,880,748, Cl. 436-60.000.
Chombert, Dominique; and Hubert-Sternback, Francoise. Convertible valet bag. 4,880,089, Cl. 190-18.00R.
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Woudsma, Roberto; Chong, David C. H.; McSweeney, Brian T.; Borgers, Stephanus M. C.; and Habraken, Egidius A. P., 4,881,192, Cl. 364-725.000.
Chookazian, Mark: *See*—
Bowers, Robert B.; and Chookazian, Mark, 4,880,580, Cl. 264-26.000.
Chornogotsky, Vasily M.: *See*—
Kanaljuk, Viktor L.; Surakov, Anatoly M.; Chornogotsky, Vasily M.; and Shifrin, Lazar N., 4,880,944, Cl. 174-138.00E.
Chou, David T.; and Cain, Paul A., to Rhone-Poulenc. Pesticidal 1-(4-Phenoxyphenyl)-5-Benzoyl urea compounds and process for preparation. 4,880,838, Cl. 514-594.000.
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Choudhury, Alok: *See*—
Stenzel, Otto; Muller, Felix; Bruckmann, Gerhard; and Choudhury, Alok, 4,881,239, Cl. 373-70.000.
Christ, F. Richard: *See*—
Ting, Albert C.; Willis, Timothy R.; Christ, F. Richard; Bacich, Steven R.; Pettit, Dean K.; Van Gent, Stanley L.; and Day, Jeffrey C., 4,880,426, Cl. 623-6.000.
Christensen, Gary M.: *See*—
Navin, James P.; Shilhavy, Ronald A.; and Christensen, Gary M., 4,880,150, Cl. 222-346.000.
Christensen, Harold F., r.: *See*—
Thomas, Jeffrey A.; Robinson, Theodore S.; Ertl, Robert A.; and Christensen, Harold F., r., 4,881,163, Cl. 364-200.000.
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Christianson, Tony. Snorkel for skin divers. 4,879,995, Cl. 128-201.110.
Christie, Hugh P. Method of and apparatus for producing infusible bag holders. 4,880,651, Cl. 426-394.000.
Chu, Cynthia T-W.: *See*—
von Ballmoos, Roland; Chu, Cynthia T-W.; Landis, Michael E.; and Derouane, Eric G., 4,880,611, Cl. 423-306.000.
Chu, Daniel T.; Rosen, Terry J.; and Cooper, Curt S., to Abbott Laboratories. 7-cycloalkyl naphthyridines. 4,880,814, Cl. 514-300.000.
Chugai Ro. Co., Ltd.: *See*—
Murakami, Koji; Higeta, Kazuya; and Touchi, Hachiro, 4,881,185, Cl. 364-557.000.
Ciba Corning Diagnostics Corp.: *See*—
Keck, Donald B.; and Love, Walter F., 4,880,752, Cl. 435-7.000.
Ciba-Geigy Corporation: *See*—
Abel, Heinz; Guth, Christian; and Berendt, Hans-Ulrich, 4,880,564, Cl. 252-321.000.
Adam, Jean-Marie, 4,880,916, Cl. 534-606.000.
Bugnon, Philippe; Grubenmann, Arnold; Medinger, Bernhard; and Schaefle, Jean, 4,880,472, Cl. 106-493.000.
Comninellis, Christos; Osterwalder, Robert U.; Plattner, Eric; and Seifert, Gottfried, 4,880,571, Cl. 552-297.000.
Denz, Martin; and Kapp-Schwoerer, Diethard, 4,879,968, Cl. 118-300.000.
Slongo, Mario; Rody, Jean; Sitek, Franciszek; and Valet, Andreas, 4,880,859, Cl. 524-91.000.
Sutterlin, Wolfgang; and Defago, Raymond, 4,880,433, Cl. 8-182.000.
Urano, Wataru; and Sugano, Yasuaki, 4,880,892, Cl. 528-89.000.
Cimco, Inc.: *See*—
Bagwell, James T.; and Howe, Blair E., 4,880,111, Cl. 206-209.100.
Cips KB: *See*—
Hansen Kaad, Flemming; and Pettersson, Ola, 4,880,598, Cl. 419-1.000.

Clamshell Partners, Ltd.: *See*—
Gardner, Kenneth; and Hunt, Rowland D., 4,879,848, Cl. 52-8.000.

Clare, Michael: *See*—
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Clarion Co., Ltd.: *See*—
Koyama, Kazuo; and Amano, Yoshikai, 4,881,273, Cl. 455-161.000.
Tazaki, Satoru; and Yoshioka, Yasuhiro, 4,881,274, Cl. 455-296.000.

Clark, Andrew J. Discharge collection system. 4,879,990, Cl. 126-25.00R.

Clark, Lowell E.: *See*—
Lesk, Israel A.; and Clark, Lowell E., 4,881,115, Cl. 357-64.000.

Clark, Mark E.; Greever, Richard G.; Schmier, Larry J.; and Wong, Jerome D., to International Business Machines Corporation. Expert system for processing errors in a multiplex communications system. 4,881,230, Cl. 371-20.100.

Clarke, John: *See*—
Farrar, David; Flesher, Peter; Skinner, Malcolm; Clarke, John; Marshall, David; and Hawe, Malcolm, 4,880,858, Cl. 524-60.000.

Clary, Thomas R.: *See*—
Burnett, Thomas W.; Clary, Thomas R.; Iannuzzelli, Vincent F.; and Kremer, Carl P., Jr., 4,880,989, Cl. 250-506.100.

Clasen, Peter: *See*—
Dietz, Wolfgang; Gerken, Rudolf; Lailach, Gunter; and Clasen, Peter, 4,880,446, Cl. 55-71.000.

Classic Corporation: *See*—
Keefer, Donald W., 4,879,775, Cl. 5-400.000.

CLE: *See*—
Champonnois, Michel, 4,880,379, Cl. 432-3.000.

Cleary, James W., to Phillips Petroleum Company. Arylene sulfide terpolymers and processes for making them. 4,880,901, Cl. 528-388.000.

Cleveland Clinic Foundation, The: *See*—
Petre, John H., 4,879,798, Cl. 29-434.000.

Cliet, Christian: *See*—
Dubesset, Michel; and Cliet, Christian, 4,881,207, Cl. 367-31.000.

Coca-Cola Company, The: *See*—
Myers, Michael J.; and Harwick, Warren J., 4,880,120, Cl. 209-3.100.

Coch, Lester G.; and Satow, Arnold, to McGean-Rohco, Inc. Process for plating adherent co-deposit of aluminum, zinc, and tin onto metallic substrates, and apparatus. 4,880,132, Cl. 220-83.000.

Cody, Wayne: *See*—
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne; Hubbs, John C.; and Foster, Charles H., 4,880,778, Cl. 514-12.000.

Coe, David J.: *See*—
Paxman, David H.; Slatter, John A. G.; and Coe, David J., 4,881,119, Cl. 357-23.400.

Coffey, James B., to NCR Corporation. Glue head flushing system. 4,880,159, Cl. 239-1.000.

Coffin, David R.: *See*—
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., 4,880,871, Cl. 525-43.000.

Cohn, David B.; and Sasaki, Gregory R., to Hughes Aircraft Company. Resonant radiation protector. 4,880,978, Cl. 250-332.000.

Cole, Jack H.: *See*—
Myers, Wilbur J.; and Cole, Jack H., 4,881,210, Cl. 367-173.000.

Coleman, Robert F.: *See*—
Meyer, George A., IV; and Coleman, Robert F., 4,880,052, Cl. 165-104.140.

Colgate-Palmolive Company: *See*—
Gaffar, Abdul, 4,880,619, Cl. 424-52.000.

Collins, Christopher G.: *See*—
Blake, Scott L.; Carthew, Millie A.; and Collins, Christopher G., 4,880,531, Cl. 210-169.000.

Collins, Dane H. Decorative message display. 4,879,823, Cl. 40-124.100.

Com Dev Ltd.: *See*—
Tang, Wai-Cheung; Cameron, Richard J.; and Bryant, David M. T., 4,881,051, Cl. 333-208.000.

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Chiron, Paul J.; Watson, Kevin D.; and Shaw, Raymond W., 4,880,541, Cl. 210-496.000.

Combi Co., Ltd.: *See*—
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihiro, 4,880,277, Cl. 297-467.000.

Combined Power Systems Limited: *See*—
Packer, Julian P.; and Almozaffar, Sam, 4,880,993, Cl. 290-2.000.

Combustion Engineering, Inc.: *See*—
Bryan, William J.; and Fuhrman, Nathan, 4,880,597, Cl. 376-419.000.
Sublette, Kerry L., 4,880,542, Cl. 210-611.000.

Comita, Paul B.: *See*—
Baum, Thomas H.; Comita, Paul B.; and Jackson, Robert L., 4,880,959, Cl. 219-121.850.

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Fedeli, Jean-Marc; and Magnin, Joel, 4,881,198, Cl. 365-12.000.
Lerat, Bernard, 4,879,913, Cl. 73-862.040.

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Booth, Rodney I.; Edwards, David W.; Wrigley, Colin W.; and Orth, Robert A., 4,879,897, Cl. 73-59.000.

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Computer Services Corporation: *See*—
Horie, Kiyoshi, 4,881,215, Cl. 369-44.000.

Congleton, Stephen R. Oil tank catwalk assembly for automotive service facility. 4,880,081, Cl. 184-1.500.

Conley, James A. Torch support for plasma cutting system. 4,880,958, Cl. 219-121.390.

Conlon, Edward J.: *See*—
Prabhu, Ashok N.; Hang, Kenneth W.; and Conlon, Edward J., 4,880,567, Cl. 252-512.000.

Conoco Inc.: *See*—
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Myers, Wilbur J.; and Cole, Jack H., 4,881,210, Cl. 367-173.000.
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Conrad, George R., to General Electric Company. Pet food container. 4,880,112, Cl. 206-216.000.

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Doleschel, Walter; Doleschel, Walter N.; and Conrad, Werner, 4,880,913, Cl. 530-387.000.

Constantz, Brent R., to Norian Corporation. In situ calcium phosphate minerals—method and composition. 4,880,610, Cl. 423-305.000.

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Lucas, James F.; and Coody, Bruce F., 4,880,225, Cl. 272-73.000.

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Cook, Louis V. Surface grade crossing structure. 4,880,158, Cl. 238-8.000.

Cooney, Daniel J. Safety razor. 4,879,811, Cl. 30-89.000.

Cooper, Curt S.: *See*—
Chu, Daniel T.; Rosen, Terry J.; and Cooper, Curt S., 4,880,814, Cl. 514-300.000.

Cooper, Lloyd G. B. Work station system. 4,880,270, Cl. 297-188.000.

Cooper, Stuart L.: *See*—
Grasel, Timothy G.; and Cooper, Stuart L., 4,880,883, Cl. 525-454.000.

Cope, Roy: *See*—
Bamforth, Charles W.; and Cope, Roy, 4,880,643, Cl. 426-16.000.

Coppola, Frank; Dumbaugh, William H., Jr.; and Ryszytiwskyj, William P., to Corning Incorporated. Method for making glass articles with defect-free surfaces and soluble glasses therefor. 4,880,453, Cl. 65-23.000.

Cordova, Colleen W.; and Cordova, David S., to Allied-Signal Inc. Organic reinforcing fibers with bundle separation during fiber cutting and storage. 4,880,704, Cl. 428-395.000.

Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., to Allied-Signal Inc. Fiber for reinforcing plastic composites and reinforced plastic composites therefrom. 4,880,871, Cl. 525-43.000.

Cordova, David S.: *See*—
Cordova, Colleen W.; and Cordova, David S., 4,880,704, Cl. 428-395.000.

Cornelius, Paul A.; Hochstrasser, Robin M.; Kallenbach, Neville R.; Rubin, Harvey; and Todaro, George J., to Kollmorgen Corporation. Pulsed light selective photolysis process for treatment of biological media and products made thereby. 4,880,512, Cl. 204-157.610.

Cornell Research Foundation, Inc.: *See*—
Saxena, Brij B.; and Rathnam, Premila, 4,880,914, Cl. 530-395.000.

Corning Incorporated: *See*—
Coppola, Frank; Dumbaugh, William H., Jr.; and Ryszytiwskyj, William P., 4,880,453, Cl. 65-23.000.

Cornish, Verle E.: *See*—
Staley, Charles M.; and Cornish, Verle E., 4,880,568, Cl. 252-548.000.

Correale, Anthony, to International Business Machines Corp. Method for providing engineering changes to LSI PLAs. 4,880,754, Cl. 437-51.000.

Corvita Corporation: *See*—
MacGregor, David C., 4,880,002, Cl. 128-335.500.

Costanzo, Jerome L.: *See*—
McNally, Donal; LaNieve, H. Leslie; and Costanzo, Jerome L., 4,880,866, Cl. 524-504.000.

Cottam, Howard B.: *See*—
Robins, Roland K.; and Cottam, Howard B., 4,880,784, Cl. 514-48.000.

Couch, Francis O.: *See*—
Schroeder, George L.; Couch, Francis O.; and Saenguraiporn, Chamna, 4,881,221, Cl. 370-32.100.

Courregelongue, Jean; and Maffrand, Jean-Pierre, to Monserbio. Process for eliminating cholesterol contained in a fatty substance of animal origin and the fatty substance with reduced cholesterol obtained. 4,880,573, Cl. 260-420.000.

Coyne, Thomas J., Jr., to T.C., Inc. Method of and apparatus for reducing iron oxide to metallic iron. 4,880,459, Cl. 75-35.000.

Crain, Steven P.: *See*—
Mullins, Michael J.; Crain, Steven P.; Woo, Edmund P.; and Murray, Daniel J., 4,880,884, Cl. 525-469.000.

Crame, Andrew J.: *See*—
Kitchin, John; Cherry, Peter C.; Pipe, Adrian J.; Crame, Andrew J.; and Borthwick, Alan D., 4,880,801, Cl. 514-215.000.

Cravens, James A.: *See*—
Cravens, Timothy J.; and Cravens, James A., 4,880,250, Cl. 280-414.100.

Cravens, Timothy J.; and Cravens, James A. Attachment kit for mobile flatbed for carrying two vehicles. 4,880,250, Cl. 280-414.100.

Crawford Fitting Company: *See*—
Johnston, Lonnie E.; and Volcansek, Steven J., 4,879,819, Cl. 33-833.000.

Crawford, John E.; and Crofut, Keith, to Cellier Corporation. Filter for filtering solids out of a liquid having a doctor blade wiping means. 4,880,539, Cl. 210-408.000.

Credali, Lino; Mulas, Carlo; Benetti, Ermanno; and Lunardon, Gianflavio, to Ausimont S.p.A. Thermoplastic polyurethane endowed with improved characteristics of resistance to heat distortion. 4,880,847, Cl. 521-157.000.

Creemer, Laura J.: *See*—
Anzeveno, Peter B.; Daniel, John K.; Creemer, Laura J.; and Liu, Paul S., 4,880,917, Cl. 536-17.400.

Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, to International Mobile Machines Corporation. AM equalizer circuit for digital systems. 4,881,240, Cl. 375-15.000.

Crofut, Keith: *See*—
Crawford, John E.; and Crofut, Keith, 4,880,539, Cl. 210-408.000.

Croucher, Melvin D.: *See*—
Drappel, Stephan; Wong, Raymond W.; and Croucher, Melvin D., 4,880,720, Cl. 430-115.000.

Crow, Mitchell A. Yarn package support for creel. 4,880,184, Cl. 242-130.000.

Crowe, Dennis E.; and Crowe, Julie L. Double pet walker. 4,879,972, Cl. 119-109.000.

Crowe, Julie L.: *See*—
Crowe, Dennis E.; and Crowe, Julie L., 4,879,972, Cl. 119-109.000.

Crucible Materials Corporation: *See*—
Dulis, Edward J.; Dorsch, Carl J.; and Stasko, William, 4,880,460, Cl. 75-236.000.

Cruse, Clint A.: *See*—
Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handerman, Alan C.; Cruse, Clint A.; and Malon, Raymond F., 4,880,441, Cl. 55-16.000.

Csernus, Istvan: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.

CSK Corporation: *See*—
Izawa, Shigeru; and Hasemi, Takashi, 4,881,214, Cl. 369-44.000.

Cucksey, Fred, to Specialty Hoisting Services, Inc. Removable and stackable hoistway door assesmbly. 4,880,210, Cl. 256-26.000.

Cullinane, Dolores M. Bud vase and attachment bracket. 4,880,133, Cl. 220-85.00H.

Cullis, Pieter R.: *See*—
Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.

Cumes, David M.; and Honikman, Terence C. Medical irrigation device. 4,880,408, Cl. 604-36.000.

Custom Chrome, Inc.: *See*—
Panzica, Ignatius J.; and Hoeptner, Herbert W., 4,880,280, Cl. 301-105.00B.

Custom Products Corporation: *See*—
Carton-Bacon, Philip H., 4,880,407, Cl. 464-43.000.

Dahms, Gerd, to Deutsche ICI GmbH. Composition for personal care product comprising alkoxylated fatty alcohol and polysiloxane. 4,880,563, Cl. 252-312.000.

Daiichi Seiyaku Co., Ltd.: *See*—
Fujiwara, Toshihiro; Tsurumi, Hideaki; and Sato, Yukio, 4,880,926, Cl. 544-105.000.

Daimler-Benz AG: *See*—
Gimmler, Helmut, 4,881,174, Cl. 364-484.000.

Dainichi Kogyo Kabushiki Kaisha: *See*—
Nakamura, Katsumi; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,795, Cl. 29-214.000.
Nakamura, Katsumi; Koide, Shigeyuki; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,796, Cl. 29-214.000.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Hoshino, Akira; Saji, Mikio; and Yamaguchi, Isamu, 4,880,852, Cl. 523-102.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Sasaki, Makoto; Takeuchi, Kiyohumi; and Takatsu, Haruyoshi, 4,880,936, Cl. 546-339.000.

Daito Communication Apparatus Co., Ltd.: *See*—
Okita, Kumakazu; Abe, Toshiaki; and Kiriyama, Masaru, 4,880,577, Cl. 264-22.000.

Damjanovich, Sandor: *See*—
Resli, Istvan; Takacs, Tibor; Damjanovich, Sandor; Gaspar, Rezso; Tron, Lajos; Szollosi, Janos; and Matko, Janos, 4,880,732, Cl. 435-29.000.

Damrow Company, Inc.: *See*—
Blodgett, Frank W.; and Bokelmann, Paul R., 4,879,946, Cl. 99-453.000.

Daniel, John K.: *See*—
Anzeveno, Peter B.; Daniel, John K.; Creemer, Laura J.; and Liu, Paul S., 4,880,917, Cl. 536-17.400.

Danieli & C. Officine Mecchaniche SpA: *See*—
Duri' , Antonino; and Nonini, Geremia, 4,879,893, Cl. 72-402.000.

Danilatos, Gerasimos D.: *See*—
Mancuso, James F.; Maxwell, William B.; and Danilatos, Gerasimos D., 4,880,976, Cl. 250-310.000.

Danisch, Lee A. Fiber optic liquid level sensor. 4,880,971, Cl. 250-227.000.

Danree, Bernard; Faulques, Michelle; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, to Institut De Recherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.). Nicotinoylpiperazines useful for treatment of convulsions. 4,880,807, Cl. 514-252.000.

Dar Products Corporation: *See*—
Caruthers, Scott, 4,880,228, Cl. 272-122.000.

Darlington Fabrics Corporation: *See*—
Rautenberg, Leonard J., 4,880,424, Cl. 604-396.000.

Darmenton, Patrick: *See*—
Grollier, Jean-Francois; Allec, Josiane; Fourcadier, Chantal; Rosenbaum, Georges; and Darmenton, Patrick, 4,880,621, Cl. 424-74.000.

Dastoli, Frank R.; Senkowski, Bernard Z.; Wagener, Dieter W.; Bogdanffy, George H.; and Vin, Gaurang R., to Alcon Laboratories, Inc. Means and method for aseptic particle-free production of articles. 4,880,581, Cl. 264-39.000.

Datac, Inc.: *See*—
Abegg, Frank, III; and Gemmell, Stephen G., 4,881,184, Cl. 364-551.010.

Davari, Bijan; Hwang, Wei; and Lu, Nicky C., to International Business Machines Corporation. Integrated trench-transistor structure and fabrication process. 4,881,105, Cl. 357-23.400.

Davert, Edward J.; and McCowin, Peter D., to Boeing Company, The. Fastener driving tool. 4,879,875, Cl. 60-588.000.

Davidow, Lance S.; and DeZeeuw, John R., to Pfizer Inc. Process for transformation of *Yarrowia lipolytica*. 4,880,741, Cl. 435-172.300.

Davids, Geert J. T.; and Wiertsema, Wiegert, to U.S. Philips Corp. Compact charge-coupled device having a conductive shielding layer. 4,881,250, Cl. 377-60.000.

Davidson, Robert J.: *See*—
Bhattacharyya, Manoj K.; Davidson, Robert J.; and Gill, Hardayal S., 4,881,143, Cl. 360-113.000.

Davidson Textron Inc.: *See*—
Brault, Alfred F.; and Gray, John D., 4,880,588, Cl. 264-163.000.

Davis, Thomas A.; and Butterworth, Donald J., to Graver Company, The. Method and apparatus for generating acid and base regenerants and the use thereof to regenerate ion-exchange resins. 4,880,513, Cl. 204-182.400.

Daweritz, Albrecht: *See*—
Kleine, Willi; Frey, Werner; and Daweritz, Albrecht, 4,880,885, Cl. 526-62.000.

Dawson, Andrew J., Jr.; Farrar, John C.; Pirc, Douglas J.; and Taylor, Atalee S., to AMP Incorporated. Filtered cable harness connector assembly. 4,880,397, Cl. 439-620.000.

Day, Eric; Aubin, Jean Paul; and Peyrot, Jan, to AIL Corporation. Timing and speed sensor for fuel injection pump. 4,879,985, Cl. 123-501.000.

Day, Jeffrey C.: *See*—
Ting, Albert C.; Willis, Timothy R.; Christ, F. Richard; Bacich, Steven R.; Pettit, Dean K.; Van Gent, Stanley L.; and Day, Jeffrey C., 4,880,426, Cl. 623-6.000.

Day, Roger A., to British Aerospace Public Limited Company. Device for closing and opening in the leading edge of a wing. 4,880,189, Cl. 244-214.000.

De Ark B.V.: *See*—
Van Den Pol, Aart A., 4,880,341, Cl. 410-1.000.

Deal, Douglas O., to Rexnord Corporation. Table top chain link with rib. 4,880,107, Cl. 198-779.000.

de Boer, Herman A.; Heynerer, Herbert L.; and Seeburg, Peter H., to Genentech, Inc. Terminal methionyl bovine growth hormone and its use. 4,880,910, Cl. 530-350.000.

Debuysscher, Pierre L., to Alcatel N.V. Asynchronous time division communication system. 4,881,223, Cl. 370-77.000.

Decima, Francois; and Rochon, Alain, to Michelin & Cie (Compagnie Generale des Etablissements Michelin). Pair of tires for two wheeled vehicle. 4,880,043, Cl. 152-526.000.

Dee, William J.: *See*—
Spivey, James R.; and Dee, William J., 4,880,326, Cl. 401-123.000.

Deere & Company: *See*—
Love, Mahlon L., 4,879,868, Cl. 56-11.200.
Patterson, Jon M.; and Brown, Douglas P., 4,880,160, Cl. 239-167.000.

Defago, Raymond: *See*—
Sutterlin, Wolfgang; and Defago, Raymond, 4,880,433, Cl. 8-182.000.

DeForrest, Sr., William. Shackle protector. 4,879,889, Cl. 70-56.000.

Deguchi, Toshihisa; Fujii, Yoshikazu; Inui, Tetsuya; Ohta, Kenji; and Katoh, Schohichi, to Sharp Kabushiki Kaisha. Optical head in an optical memory device. 4,881,216, Cl. 369-54.000.

de Jong, Anno: *See*—
Lindel, Hans; Ingendoh, Axel; Berschauer, Friedrich; de Jong, Anno; and Scheer, Martin, 4,880,840, Cl. 514-645.000.

Delahaye, Hubertus J. A. V.: *See*—
Teunissen, Antonius J. J. M.; Klop, Willem; and Delahaye, Hubertus J. A. V., 4,880,929, Cl. 544-242.000.

Delco Associates, Inc.: *See*—
D'Elia, Ronald J., 4,880,121, Cl. 209-702.000.

Delebarre, Arnaud; and Witwicki, Paul W., to Charbonnages De-France. Apparatus for supplying unclogging gas to fluidized bed apparatus. 4,880,311, Cl. 366-101.000.

Delevallee, Francoise; Deraedt, Roger; and Benzoni, Josette, to Rousel Uclaf. Method of inducing immunostimulating activity. 4,880,803, Cl. 514-232.800.

D'Elia, Ronald J., to Delco Associates, Inc. Method and apparatus for the sorting of material. 4,880,121, Cl. 209-702.000.

DeLong, Steven T.; and Snook, James E., to Rockwell International Corp. Multi-requester arbitration circuit. 4,881,195, Cl. 364-900.000.

DeMeester, Gordon D.: *See*—
Denison, Kenneth S.; Holland, G. Neil; and DeMeester, Gordon D., 4,881,033, Cl. 324-309.000.

Den norske stats oljeselskap a.s.: *See—*
Eri, Sigrid; Goodwin, James G., Jr.; Marcelin, George; and Riis, Trygve, 4,880,763, Cl. 502-302.000.
Den Bleyker, Alfred L., to Texaco Inc. Dip tube with jacket. 4,880,438, Cl. 48-69.000.
den Daas, Jan W., to Kwekerij de Bollard B.V. Method and an apparatus for mechanized setting out and harvesting of chicory. 4,879,840, Cl. 47-58.000.
Denison, Kenneth S.; Holland, G. Neil; and DeMeester, Gordon D., to Picker International, Inc. Noise-reduced synthetic T2 weighted images. 4,881,033, Cl. 324-309.000.
D'Entremont, John R.: *See—*
Tomkinson, Donald; and D'Entremont, John R., 4,879,805, Cl. 29-622.000.
Denz, Martin; and Kapp-Schwoerer, Diethard, to Ciba-Geigy Corporation. Separating device for trimming the width of a poured curtain of coating material. 4,879,968, Cl. 118-300.000.
Denzinger, Walter: *See—*
Pfohl, Sigberg; Kroener, Michael; Hartmann, Heinrich; and Denzinger, Walter, 4,880,497, Cl. 162-135.000.
De Oliveira, Joao G., to Conoco Inc. Collision protecting system for TLP structures. 4,880,088, Cl. 188-377.000.
Deraedt, Roger: *See—*
Delevallee, Francoise; Deraedt, Roger; and Benzoni, Josette, 4,880,803, Cl. 514-232.800.
Derby, Leslie B., III, to Prescott Durrell & Company. Puppet having sliding face panels defining a mouth opening. 4,880,404, Cl. 446-329.000.
Derouane, Eric G.: *See—*
von Ballmoos, Roland; Chu, Cynthia T-W.; Landis, Michael E.; and Derouane, Eric G., 4,880,611, Cl. 423-306.000.
Derouin, Louis G. Locking puzzle. 4,880,238, Cl. 273-160.000.
Derowitsch, Richard W. Process for removing carbonate from wells. 4,880,057, Cl. 166-267.000.
Desimone, Joseph A., to Johnson & Johnson Consumer Products, Inc. Toothbrush with positionable stimulator tip. 4,879,781, Cl. 15-110.000.
Desopper, Andre : *See—*
Vuillet, Alain E.; Philippe, Jean J.; and Desopper, Andre , 4,880,355, Cl. 416-228.000.
Detroz, Rene : *See—*
Gago, Ignace; and Detroz, Rene , 4,879,839, Cl. 47-57.600.
Dettwiler, Hermann. Device for converting the energy of a flowable medium into a torque. 4,880,353, Cl. 416-83.000.
Deutsch, Joseph: *See—*
Nemirovsky, Robert, 4,880,219, Cl. 269-60.000.
Deutsche ICI GmbH: *See—*
Dahms, Gerd, 4,880,563, Cl. 252-312.000.
Deutsches Primatenzentrum GmbH: *See—*
Eckstein, Fritz; Hunsmann, Gerhard; and Hartmann, Heinz, 4,880,782, Cl. 514-45.000.
DeVeau, George F.: *See—*
Aberson, James A., Jr.; DeVeau, George F.; and Yasinski, Kenneth M., 4,880,291, Cl. 350-96.210.
Dextraze, Pierre, to Bristol-Myers Company. Carbapenems with quaternized heterothioalkylthio substitution at position 2. 4,880,922, Cl. 540-350.000.
DeZeeuw, John R.: *See—*
Davidow, Lance S.; and DeZeeuw, John R., 4,880,741, Cl. 435-172.300.
Dhillon, Major S.: *See—*
Walls, John E.; and Dhillon, Major S., 4,880,555, Cl. 252-143.000.
Di Bernardo, Pietro, to Interdibipack S.p.A. Apparatus for packaging an article by means of heat-shrinkable film. 4,879,863, Cl. 53-557.000.
DiBiasi, Daniel J.: *See—*
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Dick, Harold S.: *See—*
Barkalow, Raymond W.; Dick, Harold S.; and Guthrie, Roger T., 4,879,970, Cl. 118-719.000.
Dickson, James E.; and Vasquez, Dario, Jr., to Wholesale Furniture Distributors, Inc. Chest of drawers and method of assembly. 4,880,284, Cl. 312-263.000.
Dieringer, Dale E.; and Vyprachticky, Emil. Constant force spring for cartridge magazines. 4,879,828, Cl. 42-50.000.
Dietz, Wolfgang; Gerken, Rudolf; Lailach, Gunter; and Clasen, Peter, to Bayer Aktiengesellschaft. Process for heating up moist gases containing hydrogen halides. 4,880,446, Cl. 55-71.000.
Digital Equipment Corporation: *See—*
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,881,263, Cl. 380-21.000.
Sager, David J.; Valiton, Anne S.; Stickney, Jay C.; and Ramanujan, Raj K., 4,881,165, Cl. 364-200.000.
Weng, Lih-Jyh, 4,881,075, Cl. 341-87.000.
Dillman, Norman G., to Hewlett-Packard Company. Transistor amplifier for high slew rates and capacitive loads. 4,881,045, Cl. 330-253.000.
Dingfelder, Howard E.: *See—*
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,879,808, Cl. 29-845.000.
Dionne, Roland A., to Beliveau, Robert N. Fishing seat. 4,879,963, Cl. 114-363.000.
Diotec Trust, Trustees of the: *See—*
Gregory, William D., 4,881,025, Cl. 324-61.00R.
Ditman, L. Samuel, Jr., to United States of America, Navy. Opto-optical bean deflector, modulator, and shaper. 4,880,296, Cl. 350-354.000.
Diversified Products Corporation: *See—*
Lucas, James F.; and Coody, Bruce F., 4,880,225, Cl. 272-73.000.
Dix, Johannes P.; Etzbach, Karl-Heinz; Mayer, Udo; and Sens, Ruediger, to BASF Aktiengesellschaft. Transfer of catinic dyes in their deprotonated, electrically neutral form. 4,880,769, Cl. 503-227.000.
Djerf, Tobin, to Unarco Industries, Inc. Method of making shock absorbing wheels. 4,879,794, Cl. 29-159.100.
DMM Master Technik GmbH fur Informationstrager: *See—*
Redlich, Horst; and Joschko, Gunter, 4,881,133, Cl. 358-299.000.
Dr. Rentschler Arzneimittel GmbH & Co.: *See—*
Speiser, Peter, 4,880,634, Cl. 424-450.000.
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Doe, Lester A., to R. T. Vanderbilt Company, Inc. Antioxidant synergists for lubricating compositions. 4,880,551, Cl. 252-47.500.
Doge, Ulrich, to Koyemann Werkzeuge GmbH. Drill bar with a cutter insert. 4,880,339, Cl. 408-161.000.
Doi, Kouichi, to Japan Crown Cork Co., Ltd. Composite vessel lid. 4,880,127, Cl. 215-252.000.
Doi, Muneharu: *See—*
Tsunemi, Yutaka; Asahi, Satoru; and Doi, Muneharu, 4,880,736, Cl. 435-87.000.
Doi, Yoji: *See—*
Kijima, Toshio; Tezuka, Tokuya; Doi, Yoji; Yamashita, Shuiichi; Namba, Shigetoh; and Arie, Tsutomu, 4,880,745, Cl. 435-253.300.
Doleschel, Walter; Doleschel, Walter N.; and Conrad, Werner, to Schwab & Co. Ges.m.b.H. Process for the preparation of an immunoglobulin which can be administered intravenously and is stable in liquid form. 4,880,913, Cl. 530-387.000.
Doleschel, Walter N.: *See—*
Doleschel, Walter; Doleschel, Walter N.; and Conrad, Werner, 4,880,913, Cl. 530-387.000.
Dolyny, Stanislaw. Rodent trap. 4,879,836, Cl. 43-64.000.
Donahue, Patrick J., to Beatrice Foods Co. Scannable fraud preventing coupon. 4,880,964, Cl. 235-462.000.
Donlee Technologies, Inc.: *See—*
Korenberg, Jacob, 4,879,959, Cl. 110-264.000.
Donnelly, Joseph P., to Massachusetts Institute of Technology. Hybrid two-dimensional surface-emitting laser arrays. 4,881,237, Cl. 372-50.000.
Donnerhack, Andreas; Thoma, Klemens; Volker, Wolfgang; Stratz, Thomas; and Gallmeister, Rolf-Dieter, to Messer. Griesheim. Cabin for carrying out cryotherapy. 4,880,003, Cl. 128-374.000.
Dorf Industries Pty. Ltd.: *See—*
Bernat, Georg, 4,880,209, Cl. 251-363.000.
Dorge, Franz; Erlenmayer, Udo; Faber, Bernd; Herty, Winfried; and Munz, Gunter, to Fabrik Pforzheim. High-temperature-resistant type coupling. 4,880,259, Cl. 285-137.100.
Dorn, Karsten; Grosch, Peter; and Kremer, Ingo, to Reinz-Dichtungs GmbH. Method of producing a flat gasket. 4,880,669, Cl. 427-210.000.
Dorrego, Fernando: *See—*
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Dorsch, Carl J.: *See—*
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Harwood, Van N., Jr.; Dosch, Jeffrey J.; and Netteland, Loyal G., 4,879,996, Cl. 128-202.260.
Douglas, Bruce M.: *See—*
Holcomb, Grove R.; and Douglas, Bruce M., 4,880,203, Cl. 249-24.000.
Douglas, Paul I., to Shell Oil Company. Method for reduction of mold cycle time. 4,880,583, Cl. 264-130.000.
Doutt, Kingsley A. Multiple port valve. 4,880,032, Cl. 137-625.190.
Dow Chemical Company, The: *See—*
Heistand, Robert H., II; and Duquette, Lawrence G., 4,880,758, Cl. 423-21.100.
Henslee, Walter W.; and Witkowski, Thomas S., 4,880,757, Cl. 501-104.000.
Ho, Thoi; and Kao, Che-l, 4,880,897, Cl. 528-199.000.
Mullins, Michael J.; Crain, Steven P.; Woo, Edmund P.; and Murray, Daniel J., 4,880,884, Cl. 525-469.000.
Newman, Thomas H.; Henton, David E.; and Evans, Silvia A., 4,880,554, Cl. 525-67.000.
Rose, Gene D.; Teot, Arthur S.; and Seymour, Keith G., 4,880,565, Cl. 252-355.000.
Sawyer, Lawrence H.; and Knight, George W., 4,880,691, Cl. 428-225.000.
Treybig, Duane S.; and Motes, John M., 4,880,934, Cl. 544-384.000.
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Abrutyn, Eric S., 4,880,617, Cl. 424-501.000.
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Dragmen, Kenneth J., Sr., to Picker International, Inc. Patient support for radiation imaging. 4,880,222, Cl. 269-322.000.
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Gilliland, B. David, III, 4,880,293, Cl. 350-269.000.
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Loniello, Peter J., 4,879,902, Cl. 73-304.00R.
Drori, Mordeki. Multiple disc type filter and disc construction useful therein. 4,880,537, Cl. 210-323.100.
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Dulis, Edward J.; Dorsch, Carl J.; and Stasko, William, to Crucible Materials Corporation. Powder metallurgy high speed tool steel article and method of manufacture. 4,880,460, Cl. 75-236.000.
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Van Horn, John W.; and Johnson, Clyde, 4,880,406, Cl. 464-38.000.
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Heistand, Robert H., II; and Duquette, Lawrence G., 4,880,758, Cl. 423-21.100.
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von Arb, Hans-Peter; Durr, Ulrich; Gressly, Andre ; and Studer, Franz, 4,881,233, Cl. 372-35.000.
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Miller, Ronnie F.; Dwyer, Arthur L.; Miller, Darwin A.; and Miller, Darwin L., 4,879,896, Cl. 73-46.000.
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Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.
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Dykmans, Max J. Method and apparatus for constructing circumferentially wrapped prestressed structures utilizing a membrane. 4,879,859, Cl. 52-741.000.
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Dynascan Corporation: *See*—
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E. R. Squibb and Sons, Inc.: *See*—
Worth, Peter H. L.; Eaton, Ann; and Steer, Peter L., 4,880,016, Cl. 128-885.000.
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Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.
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Beach, David E., 4,880,179, Cl. 242-71.100.
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne; Hubbs, John C.; and Foster, Charles H., 4,880,778, Cl. 514-12.000.
Burdick, Brent A.; Wu, Tai-Wing; Hilborn, David A.; and Spayd, Richard W., 4,880,749, Cl. 436-66.000.
Dowe, David R., 4,881,093, Cl. 354-234.100.
Gross, Miroslay K., 4,880,301, Cl. 350-636.000.
Hyche, Kenneth W.; and Gose, William C., 4,880,470, Cl. 106-271.000.
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Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 4,880,770, Cl. 505-1.000.
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ED. Scharwachter GmbH & Co. KG: *See*—
Tolle, Karl-Heinz; Heinemann, Heinz-Walter; Brockhaus, Jurgen; and Fiebrich, Wolfgang, 4,879,785, Cl. 16-82.000.
Edelstein, William A.: *See*—
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Edward Weck Incorporated: *See*—
Zwarun, Andrew A.; and Price, Gail L., 4,880,466, Cl. 106-21.000.
Edwards, David W.: *See*—
Booth, Rodney I.; Edwards, David W.; Wrigley, Colin W.; and Orth, Robert A., 4,879,897, Cl. 73-59.000.
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Eguchi, Toyokazu, to Kabushiki Kaisha Toshiba. Multi-band FM receiver for receiving FM broadcasting signals and TV broadcasting sound signals. 4,881,272, Cl. 455-143.000.
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Eichenlaub, John E. Apparatus for mounting marine electronic equipment. 4,880,196, Cl. 248-293.000.
Elbaum, Danek. Antiviral amphiphilics. 4,880,836, Cl. 514-588.000.
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Ludwig, Marcel; Schoen, Robert; and Elchinger, Othon, 4,880,103, Cl. 198-434.000.
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Eldridge, Gerald E.; and Visseau, Gary A., 4,880,500, Cl. 162-279.000.
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Carnel, Alain, 4,881,072, Cl. 340-870.020.
Electroplating engineers of Japan, Limited: *See*—
Sugita, Noriyuki, 4,880,511, Cl. 204-151.000.
ElectroScan Corporation: *See*—
Mancuso, James F.; Maxwell, William B.; and Danilatos, Gerasimos D., 4,880,976, Cl. 250-310.000.
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Eli Lilly and Company: *See—*
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Ellison, John E., to Parker Hannifin Corporation. Hung diaphragm solenoid valve. 4,880,205, Cl. 251-30.020.

Elmer, Mark. Manually propelled automotive painting tool cart. 4,880,248, Cl. 280-47.350.

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Ely, Stephen W.: *See—*
Mentzer, Robert M., Jr.; Ely, Stephen W.; Lasley, Robert D.; and Berne, Robert M., 4,880,783, Cl. 514-46.000.

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Kanno, Hideo; Yamashita, Shinichi; Omata, Satoshi; Enari, Masahiko; Kuno, Mitsutoshi; and Osada, Yoshiyuki, 4,881,066, Cl. 340-719.000.

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Endo, Tsunehiro: *See—*
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.

Endo, Tsuneo: *See—*
Inoue, Kazuo; Kubota, Osamu; Yano, Shunji; Tateishi, Fusao; Noda, Etsuo; Yamaguchi, Koji; and Endo, Tsuneo, 4,880,351, Cl. 415-164.000.

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Engel, Gunter; Krempl, Peter W.; List, Helmut; Posch, Uwe; and Nitsch, Alfred, to Avl Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List. Method and device for reducing the water content in piezoelectric $GAPO_4$ crystal elements and so produced crystal elements. 4,881,003, Cl. 310-311.000.

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Thomas, Pierre-Armand; and Grundman, Raphael, 4,880,336, Cl. 405-198.000.

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Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Organometallic compounds. 4,880,492, Cl. 156-610.000.

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Ericsson, Lars: *See—*
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Dorge, Franz; Erlenmayer, Udo; Faber, Bernd; Herty, Winfried; and Munz, Gunter, 4,880,259, Cl. 285-137.100.

Erne, Hans: *See—*
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Esterl, David J.: *See—*
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Piergiorgio, Rossi; and Massimo, Calanchi, 4,880,623, Cl. 424-78.000.

Evans, Donald: *See—*
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Evans, Neil L.; Tombolato, Aldo L.; Reynolds, Robert R.; and Meisner, Robert J., to Kraft, Inc. Lane adjusting apparatus for bottle guides. 4,880,104, Cl. 198-445.000.

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Factor, Arnold: *See—*
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Nelson, Linda H.; Avakian, Roger W.; and Factor, Arnold, 4,880,853, Cl. 523-136.000.
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Falconbridge Limited: *See—*
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Falconer, Thomas H.; and Benson, William H., to Eriez Manufacturing Company. Electromagnetic vibratory feeder. 4,880,106, Cl. 198-763.000.

Fangrow, Thomas F., Jr.; and Lim, Sam C., to Life Support Products, Inc. Disposable aspirator. 4,880,411, Cl. 604-149.000.

Fanuc Ltd.: *See—*
Aso, Toshiyuki; and Hosoda, Hiroshi, 4,880,957, Cl. 219-69.120.

Farley, David L. Anatomically conformable foam support pad. 4,879,776, Cl. 5-436.000.

Farrar, David; Flesher, Peter; Skinner, Malcolm; Clarke, John; Marshall, David; and Hawe, Malcolm, to Allied Colloids Limited. Water absorbing polymers. 4,880,858, Cl. 524-60.000.

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Farwerck, Karl-Peter: *See—*
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Fayerman, Jeffrey T.; Jones, Michael D.; Michel, Karl H.; Yao, Raymond C.; and Zmijewski, Milton J., to Eli Lilly and Company. Process for producing antibiotic A47934. 4,880,735, Cl. 435-71.000.
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Feddick, Michael R. Drive engagement apparatus. 4,880,328, Cl. 403-1.000.
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Feider, Thomas; Lamer, Gerald P.; and Lenius, Norbert W., to Marine Travelift, Inc. Straddle crane steering system. 4,880,124, Cl. 212-218.000.
Fejer, Martin M.; and Byer, Robert L., to Leland Stanford, Jr. University, Board of Trustees of. Quantum well optical electric field biased nonlinear method and apparatus. 4,880,297, Cl. 350-355.000.
Feng, Yee C. Tool for dip-type ICs. 4,879,806, Cl. 29-741.000.
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Ferre-Blanquez, Juan. Textile label. 4,880,256, Cl. 283-92.000.
Ferre, F. Budd; Sims, Rowell; Bowen, Wesley G.; and Kesler, Vibert L., to Parapluie, Ltd. Integrated free-standing vehicle detailing service center. 4,880,026, Cl. 137-234.600.
Ferris Industries, Inc.: *See—*
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Fesman, Gerald, to Akzo America Inc. Flame laminatable polyether urethane foam. 4,880,844, Cl. 521-107.000.
Fey, Maurice G.; Lange, William J.; Freidhoff, Carl B.; and Slade, Paul G., to Westinghouse Electric Corp. Vacuum interrupter with simplified enclosure and method of assembly. 4,880,947, Cl. 200-144.00B.
Fiat Auto S.p.A.: *See—*
Piazzo, Diego, 4,879,980, Cl. 123-193.00H.
Fichlseder, Martin; and Preuss, Ingo, to Krauss-Maffei A.G. Process for production of an injected molded part. 4,880,587, Cl. 264-154.000.
Ficho, William, to Vasilia, Ltd. Cigarette lighter with charm mounted thereon. 4,880,377, Cl. 431-126.000.
Fichtenbeiner, Heiner: *See—*
Brunner, Rudolf; and Fichtenbeiner, Heiner, 4,879,945, Cl. 91-518.000.
Fiebrich, Wolfgang: *See—*
Tolle, Karl-Heinz; Heinemann, Heinz-Walter; Brockhaus, Jurgen; and Fiebrich, Wolfgang, 4,879,785, Cl. 16-82.000.
Field, Arthur K.: *See—*
Ashton, Wallace T.; Canning, Laura F.; Field, Arthur K.; and Tolman, Richard L., 4,880,820, Cl. 514-322.000.
Filter Tech Inc.: *See—*
Barcomb, Lyle B.; and El-Hindi, Lawrence, 4,880,538, Cl. 210-401.000.
Finch, Harry: *See—*
Wallis, Christopher J.; Finch, Harry; and Hallett, Peter, 4,880,800, Cl. 514-211.000.
Findlay, Nathanial B.: *See—*
Jonas, Werner; and Findlay, Nathanial B., 4,880,224, Cl. 272-72.000.
Finic, B.V.: *See—*
Miotti, Giosue, 4,880,334, Cl. 405-149.000.
Firmenich S.A.: *See—*
Holzner, Gunter; Kittner, Peter; and Blake, Anthony, 4,880,649, Cl. 426-302.000.
First Pacific Networks: *See—*
Long, James C., 4,881,246, Cl. 375-84.000.
Fischer, Addison. Document composition system using named formats and named fonts. 4,881,197, Cl. 364-900.000.
Fisher, Paul C.: *See—*
Fisher, Paul C., Jr.; Van Der Meer, Wiebe H.; and Fisher, Paul C., 4,881,088, Cl. 346-140.00R.
Fisher, Paul C., Jr.; Van Der Meer, Wiebe H.; and Fisher, Paul C. Plotter pen ink level detector. 4,881,088, Cl. 346-140.00R.
Fisher, William: *See—*
Carpenter, Thomas L.; Fisher, William; and Smith, Thomas A., 4,880,645, Cl. 426-89.000.
Flanagan, Patricia J.: *See—*
Dow, Douglas; and Flanagan, Patricia J., 4,880,655, Cl. 426-593.000.
Flanigen, Edith M.: *See—*
Bedard, Robert L.; Vail, Lawrence D.; Wilson, Stephen T.; and Flanigen, Edith M., 4,880,761, Cl. 502-215.000.
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith M., 4,880,520, Cl. 208-46.000.
Flesche, Fred. Model automobile rim construction. 4,880,279, Cl. 301-36.00R.
Flesher, Peter: *See—*
Farrar, David; Flesher, Peter; Skinner, Malcolm; Clarke, John; Marshall, David; and Hawe, Malcolm, 4,880,858, Cl. 524-60.000.
Flitex: *See—*
Kubata, Milan; Soukup, Jiri; and Trhlik, Jiri, 4,880,183, Cl. 242-125.100.
Floreancig, Eligio M.; Jandrain, Jean-Claude M.; Legros, Desire M.; and Simonon, Jean-Claude M., to Saint-Gobain Vitrage. Automatic device for trimming sheets of laminated material. 4,879,933, Cl. 83-76.100.
FlowMole Corporation: *See—*
Chau, Albert W.; and Mercer, John E., 4,881,083, Cl. 342-459.000.
Fluoroware, Inc.: *See—*
Kos, Robert D., 4,880,116, Cl. 206-454.000.
FMC Corporation: *See—*
Hatzidimitriu, Stratos E.; and Hall, W. Reginald, 4,880,647, Cl. 426-239.000.
Fock, Jurgen: *See—*
Esselborn, Eberhard; and Fock, Jurgen, 4,880,906, Cl. 528-403.000.
Fogelson, Mark: *See—*
Adler, Robert; Fogelson, Mark; and Kaplan, Sam, 4,880,665, Cl. 427-126.300.
Folk, Kenneth F.: *See—*
Adlon, Daniel T.; and Folk, Kenneth F., 4,879,934, Cl. 83-76.900.
Ford Aerospace Corporation: *See—*
Garrett, Harold E., 4,879,790, Cl. 29-1.200.
Ford Motor Company: *See—*
Moskowitz, David; and Phillips, Charles W., 4,880,600, Cl. 419-12.000.
Forlow, John K.: *See—*
Benedict, Roger J.; and Forlow, John K., 4,879,894, Cl. 72-405.000.
Forman, Edward W., Jr.: *See—*
Belmont, Kirk E.; Bullard, Edward M.; DiBiasi, Daniel J.; Forman, Edward W., Jr.; and McIntyre, David E., 4,880,316, Cl. 383-75.000.
Formica Corporation: *See—*
Park, John J.; White, Paul W.; and Richardson, Calvin, 4,880,689, Cl. 428-143.000.
Formulations Development Labs, Inc.: *See—*
Park, Moo K., 4,880,835, Cl. 514-570.000.
Forster, Friedrich, to UHDE GmbH. Device for achieving a uniform distribution of the gas flowing radially through a catalyst bed. 4,880,603, Cl. 422-218.000.
Fortmann, Charles M.: *See—*
O'Dowd, James G.; Catalano, Anthony W.; Fortmann, Charles M.; and Lee, Ora J., 4,880,664, Cl. 427-109.000.
Foster, Charles H.: *See—*
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne; Hubbs, John C.; and Foster, Charles H., 4,880,778, Cl. 514-12.000.
Foster, David R.; and Schneider, Irwin, to United States of America, Navy. Method for forming copious $(F_2^+)_A$ centers in certain stable, broadly tunable laser-active materials. 4,881,234, Cl. 372-42.000.
Foster Wheeler Energy Corporation: *See—*
Magol, Byram J.; Fay, John D.; and Garkawe, Michael, 4,880,450, Cl. 55-269.000.
Fountain, Michael W.: *See—*
Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.
Fourcadier, Chantal: *See—*
Grollier, Jean-Francois; Allec, Josiane; Fourcadier, Chantal; Rosenbaum, Georges; and Darmenton, Patrick, 4,880,621, Cl. 424-74.000.
Framatome: *See—*
Sevelinge, Gerard, 4,879,927, Cl. 81-56.000.
Francoeur, Ann-Michele, to Miragen, Inc. Individual-specific antibody identification methods. 4,880,750, Cl. 436-501.000.
Francois, Denis J.: *See—*
Repe, Thouron; and Francois, Denis J., 4,879,941, Cl. 89-1.140.
Fransen, Benedictus C. H.: *See—*
Weekamp, Johannus W.; Fransen, Benedictus C. H.; and van der Ploeg, Hendrik, 4,881,151, Cl. 361-531.000.
Franz, Robert M. Film coated tablet of ranitidine HCl. 4,880,636, Cl. 424-480.000.
Fraser-Milla, Karen R.: *See—*
Khosah, Robinson P.; Novak, John W.; Weaver, Douglas G.; Fraser-Milla, Karen R.; and Burr, Richard R., 4,880,543, Cl. 210-635.000.
Freidhoff, Carl B.: *See—*
Fey, Maurice G.; Lange, William J.; Freidhoff, Carl B.; and Slade, Paul G., 4,880,947, Cl. 200-144.00B.
Freidinger, Roger M., to Merck & Co., Inc. Amino acid analogs. 4,880,938, Cl. 548-492.000.
Frejborg, Frey, to A. Ahlstrom Corporation. Pulp screening apparatus. 4,880,540, Cl. 210-413.000.
French Limited Company - Centaure Robotique: *See—*
Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, 4,881,269, Cl. 382-8.000.
Frey, Robert E. Self-cleaning screening device. 4,880,530, Cl. 209-380.000.

Frey, Werner: *See*—
Kleine, Willi; Frey, Werner; and Daweritz, Albrecht, 4,880,885, Cl. 526-62.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*— Von Haas, Rainer, 4,879,930, Cl. 82-158.000.

Friedlander, Charles B.: *See*—
Hayes, Deborah E.; Weissberg, Alan B.; Friedlander, Charles B.; and Ryan, Edward T., 4,880,668, Cl. 427-162.000.

Friedle, Dennis J.; Kolb, Richard P.; and McLeod, Kenneth M., to Outboard Marine Corporation. Anti-siphon fuel valve assembly for marine installations. 4,880,403, Cl. 440-88.000.

Frito-Lay, Inc.: *See*—
Keller, Lewis C.; and Bowles, Cecil A., 4,880,653, Cl. 426-549.000.

Fritzsche, Alfred K.: *See*—
Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handerman, Alan C.; Cruse, Clint A.; and Malon, Raymond F., 4,880,441, Cl. 55-16.000.

Frost, Phillip, to Baker Cummins Pharmaceuticals, Inc. Method of treatment for allergic rhinitis. 4,880,813, Cl. 514-282.000.

Fu, Cheun-Yuan, to Tatung Company of America. Ventilated, no-drip, housing for electrical apparatus. 4,880,594, Cl. 361-383.000.

Fuchigami, Mitsuru: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,880,767, Cl. 503-217.000.

Fuhrman, Nathan: *See*—
Bryan, William J.; and Fuhrman, Nathan, 4,880,597, Cl. 376-419.000.

Fuji-Davison Chemical, Ltd.: *See*—
Okamura, Katsutoshi; Esaki, Yasuo; Matsuzawa, Koichi; and Asano, Katsuhiko, 4,880,650, Cl. 426-330.400.

Fuji Electric Co., Ltd.: *See*—
Kandatsu, Kiyoshi; Yamazaki, Makoto; and Kinota, Hiroshi, 4,880,948, Cl. 200-151.000.
Kitagawa, Seizo; and Narita, Mitsuru, 4,880,717, Cl. 430-58.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Konno, Toshihiro, 4,880,073, Cl. 180-140.000.
Matsumoto, Rempei, 4,880,074, Cl. 180-142.000.
Ohkumo, Hiroya, 4,880,094, Cl. 192-0.052.
Sakamoto, Masanori, 4,879,986, Cl. 123-571.000.

Fuji Oil Company, Limited: *See*—
Matsunami, Hidenobu; Tsuruda, Takahiro; Hitosugi, Naoki; and Hirukawa, Yoshinori, 4,880,644, Cl. 426-46.000.

Fuji Photo Film Co., Ltd.: *See*—
Hamamura, Ken; Kawahara, Sei; and Goto, Mitsuhiro, 4,880,374, Cl. 425-185.000.
Heki, Tatsuo; Inoue, Noriyuki; and Hirano, Shigeo, 4,880,729, Cl. 430-410.000.
Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Ohnishi, Hiroshi, 4,880,142, Cl. 222-56.000.
Hirai, Hiroyuki; and Yabuki, Yoshiharu, 4,880,723, Cl. 430-218.000.
Hirai, Hiroyuki; and Iwano, Haruhiko, 4,880,725, Cl. 430-373.000.
Hosoi, Yuichi; and Takahashi, Kenji, 4,880,987, Cl. 250-484.100.
Inoue, Noriyuki; and Heki, Tatsuo, 4,880,727, Cl. 430-378.000.
Ishikawa, Shunichi, 4,880,721, Cl. 430-138.000.
Ishikawa, Takatoshi; and Nakajima, Junya, 4,880,728, Cl. 430-380.000.
Kato, Eiichi; and Ishii, Kazuo, 4,880,716, Cl. 430-49.000.
Ryoke, Katsumi; Takahashi, Masatoshi; Hashimoto, Akihiro; Okita, Tsutomu; and Hanai, Kazuko, 4,880,692, Cl. 428-323.000.
Ryoke, Katsumi; Takahashi, Masatoshi; Hashimoto, Akihiro; Okita, Tsutomu; and Yoneyama, Takashi, 4,880,693, Cl. 428-323.000.
Sato, Kozo; and Nakamura, Yoshisada, 4,880,730, Cl. 430-520.000.
Shiba, Keisuke; Ichijima, Seiji; Sakanoue, Kei; and Taguchi, Seiichi, 4,880,726, Cl. 430-376.000.
Shidara, Shinichi, 4,881,095, Cl. 354-298.000.
Shiraishi, Hisashi, 4,880,984, Cl. 250-484.100.
Toyama, Tadao; Ohba, Hisao; and Kunichika, Kenji, 4,880,724, Cl. 430-302.000.

Fuji Xerox Co., Ltd.: *See*—
Murofushi, Toshiaki; Nakazawa, Hiroshi; Oyamada, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; and Ohya, Yasuhiro, 4,880,719, Cl. 430-106.600.
Saito, Koichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,881,089, Cl. 346-140.00R.

Fujii, Kiyoshi: *See*—
Uchida, Shinya; Kohzu, Kazuya; Fujii, Kiyoshi; and Kawakami, Moriatsu, 4,881,268, Cl. 382-7.000.

Fujii, Masao: *See*—
Yoshida, Takayuki; Fujii, Masao; and Sakuma, Kiyoshi, 4,880,054, Cl. 165-133.000.

Fujii, Yoshikazu: *See*—
Deguchi, Toshihisa; Fujii, Yoshikazu; Inui, Tetsuya; Ohta, Kenji; and Katoh, Schohichi, 4,881,216, Cl. 369-54.000.

Fujikura, Takashi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 4,880,841, Cl. 514-654.000.

Fujimori, Takahiro: *See*—
Watanabe, Osamu; Komatsu, Kosuke; Ishibashi, Masaichi; Kimura, Mutsumi; Koyama, Shinsuke; Fujimori, Takahiro; Fujiwara, Tadashi; and Kuroiwa, Junko, 4,881,067, Cl. 340-750.000.

Fujimura, Tatsuhito; and Sakurai, Motoi, to Mitsui Toatsu Chemicals, Inc. Method of culturing protoplasts. 4,880,744, Cl. 435-240.460.

Fujimura, Yoshihiko: *See*—
Saito, Koichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,881,089, Cl. 346-140.00R.

Fujioka, Keiji: *See*—
Yamahira, Yoshiya; Okuzawa, Yoshiko; Fujioka, Keiji; Sato, Shigeji; and Ishikawa, Reimei, 4,880,796, Cl. 514-206.000.

Fujita, Atsushi: *See*—
Seto, Yutaka; Suzuki, Shigehiro; Suzuki, Tomohiro; Fujita, Atsushi; Tai, Akira; and Yoshino, Masahiro, 4,881,103, Cl. 355-251.000.

Fujita, Nobuhiko: *See*—
Itozaki, Hideo; Tanaka, Saburo; Fujita, Nobuhiko; Yazu, Shuji; and Jodai, Tetsuji, 4,880,773, Cl. 505-1.000.

Fujita, Shuji; Yoshimura, Shoji; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, to MECT Corporation. Un-natural ceramide related compounds and preparation thereof. 4,880,572, Cl. 260-404.000.

Fujitsu Limited: *See*—
Hidada, Norio; and Hirachi, Yasutake, 4,881,116, Cl. 357-74.000.
Nakagawa, Kenji, 4,881,257, Cl. 378-35.000.

Fujiwara, Tadashi: *See*—
Watanabe, Osamu; Komatsu, Kosuke; Ishibashi, Masaichi; Kimura, Mutsumi; Koyama, Shinsuke; Fujimori, Takahiro; Fujiwara, Tadashi; and Kuroiwa, Junko, 4,881,067, Cl. 340-750.000.

Fujiwara, Takeshi: *See*—
Inoue, Masatsugu; Tokita, Kiyoshi; Sone, Toshinao; Fujiwara, Takeshi; and Nakane, Kazunori, 4,881,004, Cl. 313-408.000.

Fujiwara, Toshihiro; Tsurumi, Hideaki; and Sato, Yukio, to Daiichi Seiyaku Co., Ltd. Optical resolution of benzoxazines. 4,880,926, Cl. 544-105.000.

Fukahori, Hidehiko; Suzuki, Masayuki; and Aihara, Yoshihiko, to Canon Kabushiki Kaisha. Motor driven camera. 4,881,092, Cl. 354-152.000.

Fukano, Michio: *See*—
Hojo, Takeshi; Yamamoto, Kanshi; Kawada, Shinichi; Murabayashi, Kazushige; Akimoto, Mamoru; and Fukano, Michio, 4,879,918, Cl. 74-5.470.

Fukaya, Toshio: *See*—
Ito, Takeo; Takeuchi, Hajime; Hashimoto, Minoru; Fukaya, Toshio; and Koishi, Masumi, 4,880,666, Cl. 427-128.000.

Fukazawa, Takeshi: *See*—
Mizukoshi, Masahito; Kawasaki, Eishi; Miyajima, Takeshi; and Fukazawa, Takeshi, 4,881,056, Cl. 338-4.000.

Fukuda, Kazuyuki: *See*—
Kumazawa, Tetsuo; Shimaoka, Makoto; Fukuda, Kazuyuki; and Adachi, Eiichi, 4,880,290, Cl. 350-96.200.

Fukuda, Yutaro: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; Suzuki, Fumio; Habara, Hideaki; Fukuda, Yutaro; and Sato, Haruki, 4,880,877, Cl. 525-84.000.

Fukumoto, Heijiro: *See*—
Akagawa, Minoru; Naoi, Satoshi; and Fukumoto, Heijiro, 4,880,518, Cl. 204-298.000.

Fukumoto, Hiroshi: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,881,084, Cl. 346-1.100.

Fukuzawa, Tadashi: *See*—
Chinone, Naoki; Uomi, Kazuhisa; Fukuzawa, Tadashi; Matsueda, Hideaki; Kajimura, Takashi; and Ohtoshi, Tsukuru, 4,881,235, Cl. 372-45.000.
Chinone, Naoki; Uomi, Kazuhisa; Fukuzawa, Tadashi; Matsueda, Hideaki; and Kajimura, Takashi, 4,881,238, Cl. 372-68.000.

Fuller, Robert G., to Lucas Industries Public Limited Company. Anti-lock hydraulic modulator units for vehicles. 4,880,075, Cl. 180-219.000.

Funabashi, Hiroshi: *See*—
Inoue, Takeshi; Funabashi, Hiroshi; and Nakagawa, Yukihiro, 4,880,078, Cl. 181-232.000.

Funabashi, Kiyomi: *See*—
Matsuda, Masami; Funabashi, Kiyomi; Nishi, Takashi; Komori, Itaru; Baba, Tsutomu; Yusa, Hideo; Uchida, Shunsuke; Adachi, Tetsuro; Ohsumi, Katsumi; and Sato, Tomohiro, 4,880,595, Cl. 376-313.000.

Fuquay, Kevin. Hand-held spray device. 4,880,165, Cl. 239-525.000.

Furukawa, Hisao: *See*—
Matsumura, Shoichi; Nanbu, Toshiro; and Furukawa, Hisao, 4,880,861, Cl. 524-314.000.

Furuya, Akira, to Canon Kabushiki Kaisha. Process for producing rollers equipped with a rubber layer. 4,880,590, Cl. 264-275.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Morimoto, Kiyoshi; Watanabe, Hiroshi; Itoh, Shigeo; Ogawa, Yukio; and Uzawa, Satoshi, 4,881,005, Cl. 313-422.000.
Tsuruoka, Yoshihisa, 4,881,017, Cl. 313-495.000.

G-C Toshi Kogyo Corporation: *See*—
Hasegawa, Akira, 4,880,887, Cl. 526-141.000.

G. D. Searle & Co.: *See*—
Brewer, Stephen J.; and Sassenfeld, Helmut M., 4,880,911, Cl. 530-351.000.
Hansen, Donald W., Jr.; Pitzele, Barnett S.; Clare, Michael; and Hamilton, Robert W., 4,880,829, Cl. 514-445.000.

Gaddipati, Achuta R.: *See*—
Charles, Richard J.; and Gaddipati, Achuta R., 4,880,599, Cl. 419-6.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Anticalculus oral composition. 4,880,619, Cl. 424-52.000.

Gago, Ignace; and Detroz, Rene , to Solvay & Cie. (Societe Anonyme). Coated seeds and process for preparing them. 4,879,839, Cl. 47-57.600.

Gahagan, William L. Multipurpose flashlight. 4,881,155, Cl. 362-191.000.

Gala, James M., Jr., to Soundwave Fidelity Corporation. Apex loudspeaker. 4,881,265, Cl. 381-90.000.

Galera, Carlos: *See—*
Sunkel, Carlos; Fay de Casa Juana, Miguel; Dorrego, Fernando; Pando, Basilio; Alvarez-Builla, Julio; Vaquero, Juan J.; Galera, Carlos; and Vazquez, Maria L., 4,880,894, Cl. 548-152.000.

Gallagher, Thomas A.; Knowlton, Paul; and Patarini, Leon, to Van Dorn Company. Ringless paint container. 4,880,131, Cl. 220-83.000.

Gallaher, William R., to Research Corporation Technologies, Inc. Method of prevention or treatment of AIDS by inhibition of human immunodeficiency virus. 4,880,779, Cl. 514-15.000.

Gallmeister, Rolf-Dieter: *See—*
Donnerhack, Andreas; Thoma, Klemens; Volker, Wolfgang; Stratz, Thomas; and Gallmeister, Rolf-Dieter, 4,880,003, Cl. 128-374.000.

Galloway, Joanne. Floating picture frame. 4,879,824, Cl. 40-152.100.

Galpin, Robert K. P.: *See—*
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.

Gandolfi, Luciano; and Ferla, Giuseppe, to SGS-ATES Componenti Elettronici S.p.A. Semiconductor power device formed of a multiplicity of identical parallel-connected elements. 4,881,117, Cl. 357-74.000.

Garcia, Richard R.; and Sites, Royal H., to Ranco Incorporated. Temperature sensing apparatus and method of making same. 4,881,057, Cl. 338-28.000.

Gardner, Kenneth; and Hunt, Rowland D., to Clamshell Partners, Ltd. Viewing structure. 4,879,848, Cl. 52-8.000.

Garganese, Richard S. Display card assembly for ring-like ornamental articles. 4,880,117, Cl. 206-487.000.

Garkawe, Michael: *See—*
Magol, Byram J.; Fay, John D.; and Garkawe, Michael, 4,880,450, Cl. 55-269.000.

Garrett, Harold E., to Ford Aerospace Corporation. Method of making a projectile having a driving band. 4,879,790, Cl. 29-1.200.

Garrett, Roderick D. Apparatus for the production of pulp suspensions. 4,880,171, Cl. 241-46.110.

Gas Research Institute: *See—*
McDonald, William J.; Wasson, Michael R.; Leitko, Curtis E.; Pittard, Gerard T.; and Maurer, William C., 4,880,065, Cl. 175-71.000.

Gaskell, Alfred J.: *See—*
Bartels, James I.; Patton, Paul B.; Kidder, Kenneth B.; and Gaskell, Alfred J., 4,880,376, Cl. 431-12.000.

Gaspar, Rezso: *See—*
Resli, Istvan; Takacs, Tibor; Damjanovich, Sandor; Gaspar, Rezso; Tron, Lajos; Szollosi, Janos; and Matko, Janos, 4,880,732, Cl. 435-29.000.

Gates, Alan B.: *See—*
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,879,808, Cl. 29-845.000.

Gaulard, Michel, to Automobiles Peugeot; and Automobiles Citroen. Apparatus for the moulding of a cylinder block or of a corresponding foundry pattern. 4,880,048, Cl. 164-342.000.

Gausepohl, Hermann: *See—*
Wassmuth, Georg; Ruppmich, Karl; Seiler, Erhard; Gausepohl, Hermann; and Benker, Klaus, 4,880,875, Cl. 525-67.000.

Gauss, Edward J., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Computer printer stand. 4,880,202, Cl. 248-676.000.

Gauthier, Christian, to Jaeger. Electric switch for controlling change-of-direction indicators on a motor vehicle. 4,880,945, Cl. 200-61.540.

Gavrielides, Athanasios: *See—*
Peterson, Phillip R.; Gavrielides, Athanasios; and Cardimona, David A., 4,880,996, Cl. 307-425.000.

Gazith, Joseph: *See—*
Shroot, Braham; Watts, Oliver; Gazith, Joseph; and Cavey, Marie-Therese, 4,880,941, Cl. 549-57.000.

Gebo: *See—*
Ludwig, Marcel; Schoen, Robert; and Elchinger, Othon, 4,880,103, Cl. 198-434.000.

Geer, Kenton D.: *See—*
Graham, Kenneth; Geer, Kenton D.; and Bednarski, Katherine, 4,879,821, Cl. 36-44.000.

Geise, John; and Niese, Lynn. Apparatus and method for supporting articles. 4,880,194, Cl. 248-166.000.

Gelenkwellenbau GmbH: *See—*
Ende, Eberhard, 4,880,405, Cl. 464-14.000.

Gelfman, Stanley. Cable reel. 4,880,182, Cl. 242-117.000.

Gemmell, Stephen G.: *See—*
Abegg, Frank, III; and Gemmell, Stephen G., 4,881,184, Cl. 364-551.010.

Genentech, Inc.: *See—*
de Boer, Herman A.; Heynerer, Herbert L.; and Seeburg, Peter H., 4,880,910, Cl. 530-350.000.

General DataComm, Inc.: *See—*
Bains, Kuldip S., 4,881,224, Cl. 370-82.000.

General Electric Company: *See—*
Avakian, Roger W., 4,880,854, Cl. 523-136.000.
Avakian, Roger W., 4,880,856, Cl. 123-136.000.
Bottomley, Paul A.; Roemer, Peter B.; Edelstein, William A.; and Mueller, Otward M., 4,881,032, Cl. 324-309.000.
Charles, Richard J.; and Gaddipati, Achuta R., 4,880,599, Cl. 419-6.000.
Conrad, George R., 4,880,112, Cl. 206-216.000.
Guggenheim, Thomas L.; and Guiles, Joseph W., 4,880,899, Cl. 528-370.000.
Hurtgen, Jerome P., 4,880,391, Cl. 439-221.000.
Nelson, Linda H.; Avakian, Roger W.; and Factor, Arnold, 4,880,850, Cl. 522-79.000.
Nelson, Linda H.; Avakian, Roger W.; and Factor, Arnold, 4,880,853, Cl. 523-136.000.
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Prabhu, Ashok N.; Hang, Kenneth W.; and Conlon, Edward J., 4,880,567, Cl. 252-512.000.

General Electric Company, p.l.c., The: *See—*
Meakin, Douglas B.; and Miglioratо, Piero, 4,880,753, Cl. 437-41.000.

General Foods Corp.: *See—*
Carpenter, Thomas L.; Fisher, William; and Smith, Thomas A., 4,880,645, Cl. 426-89.000.

General Hospital Corporation, The: *See—*
Lauffer, Randall B., 4,880,008, Cl. 128-654.000.

General Housewares Corporation: *See—*
Levinson, Melvin L., 4,880,951, Cl. 219-10.55E.

General Instrument Corporation: *See—*
Krause, Edward A., 4,881,125, Cl. 358-141.000.

General Motors Corporation: *See—*
Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., 4,880,283, Cl. 305-35.00R.

General Signal Corporation: *See—*
Wanta, Mark S., 4,880,309, Cl. 356-401.000.

Genetics Institute, Inc.: *See—*
Rozzell, J. David, 4,880,738, Cl. 435-106.000.

Genex Corporation: *See—*
Ladner, Robert C., 4,881,175, Cl. 364-496.000.

Genicom Corporation: *See—*
Milliser, Charles E.; Karalevicz, John M.; and Quick, Harry C., 4,880,323, Cl. 400-196.100.

Gentry, Dennis L.: *See—*
Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L., 4,880,211, Cl. 266-44.000.

Gentry, Roger. Single shot falling block action rifle. 4,879,827, Cl. 42-23.000.

George, Eric R., to Shell Oil Company. Mica and glass reinforced polyketone polymers. 4,880,865. Cl. 524-449.000.

Georghegan, William D., to Board of Regents, The University of Texas System. Immunoglobulin adsorption. 4,880,751, Cl. 436-518.000.

Georgia Tech Research Corporation: *See—*
Erbil, Ahmet, 4,880,670, Cl. 427-226.000.

Geotronics Metaltech AB: *See—*
Hagglund, Hans; Ericsson, Lars; and Wiklund, Rudolf, 4,880,212, Cl. 266-94.000.

Gerber, Heinz J., to Gerber Scientific, Inc. Reciprocating knife cutter with flexible drive portion. 4,879,935, Cl. 83-748.000.

Gerber Scientific, Inc.: *See—*
Gerber, Heinz J., 4,879,935, Cl. 83-748.000.

Geren, James G.: *See—*
Cellini, John V.; Ronghi, Mario F.; and Geren, James G., 4,880,504, Cl. 202-185.600.

Gergen, William P.: *See—*
Lutz, Robert G.; and Gergen, William P., 4,880,908, Cl. 525-468.000.

Gerhardt, Don J.: *See—*
Capp, F. William; Gerhardt, Don J.; and Little, Randal A., 4,881,055, Cl. 337-404.000.

Gerken, Rudolf: *See—*
Dietz, Wolfgang; Gerken, Rudolf; Lailach, Gunter; and Clasen, Peter, 4,880,446, Cl. 55-71.000.

Gerl, Josef: *See—*
Nitzinger, Karl; Gerl, Josef; Steiner, Herbert; and Hess, Helmut, 4,880,955, Cl. 219-10.55R.

Gesy, Jerry. Door sealing apparatus. 4,880,046, Cl. 160-194.000.

Geyer, Harry J.: *See—*
Sharma, Ravinder K.; Geyer, Harry J.; and Mitchell, Douglas G., 4,880,708, Cl. 428-620.000.

Ghali, Ragui. Foam, composition and method of production, containing polyurethane, polyisocyanurate and polyurea groups. 4,880,848, Cl. 521-174.000.

Ghose, Sanjoy; Bronshvatch, Efim; and Peterson, Miles L., to Seagate Technology, Inc. Integrated disc drive and actuators support. 4,881,140, Cl. 360-106.000.

Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, to International Paper Company. Oxygen impermeable leak free container. 4,880,701, Cl. 428-34.200.

Gibson, Jeffrey W.; and Bayman, Hal, to Burlington Industries, Inc. Vacuum powered manually operated cleaning tool for active surfaces of fluid-jet print head. 4,881,085, Cl. 346-75.000.

Giese, Robert D.: *See—*
Butzen, James K.; Happ, Kenneth C.; and Giese, Robert D., 4,879,847, Cl. 51-170.00R.

Gilbert, Gregory N., to Halliburton Logging Services, Inc. Hydraulic system in formation test tools having a hydraulic pad pressure prior-

ity system and high speed extension of the setting pistons. 4,879,900, Cl. 73-155.000.

Giles, John E. Apparatus and methods for sharpening points. 4,879,844, Cl. 51-31.000.

Gill, Hardayal S.: *See—*
Bhattacharyya, Manoj K.; Davidson, Robert J.; and Gill, Hardayal S., 4,881,143, Cl. 360-113.000.

Gilliland, B. David, III, to DRD, Ltd. Optic fiber shutter apparatus. 4,880,293, Cl. 350-269.000.

Gilstad, Dennis W.: *See—*
Jaeb, Jonathan P.; Gilstad, Dennis W.; and Branstetter, Ronald L., 4,880,304, Cl. 356-41.000.

Gimmler, Helmut, to Daimler-Benz AG. Sinusoidal signal frequency measuring device. 4,881,174, Cl. 364-484.000.

Ginsberg, Richard S.: *See—*
Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.

Giroux, Richard L.: *See—*
Brandell, John T.; and Giroux, Richard L., 4,880,059, Cl. 166-332.000.

Giuffre, Kenneth A.; and Giuffre, Michele A. Sharp instrument protection means. 4,880,413, Cl. 604-192.000.

Giuffre, Michele A.: *See—*
Giuffre, Kenneth A.; and Giuffre, Michele A., 4,880,413, Cl. 604-192.000.

Glanz, Kenneth D.: *See—*
Miller, Robert E.; Vervacke, Steven L.; Bahowick, Timothy J.; and Glanz, Kenneth D., 4,880,766, Cl. 503-212.000.

Glaser, Thomas: *See—*
Schohe, Rudolf; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,880,802, Cl. 514-222.200.

Glassco, Robert B.; and Noble, Robert L., to Mansion Industries, Inc. Modular building construction and method of building assembly. 4,879,850, Cl. 52-82.000.

Glasser, Joseph; and Lask, Ursula E. Subterranean fluid filtering and drainage system. 4,880,333, Cl. 405-43.000.

Glaverbel: *See—*
Hecq, Andre ; and Thomas, Jean-Francois, 4,880,677, Cl. 428-38.000.
Thomas, Jean-Francois; Terneu, Robert; Van Cauter, Albert; and Van Laethem, Robert, 4,880,698, Cl. 428-333.000.

Glaxo Group Limited: *See—*
Kitchin, John; Cherry, Peter C.; Pipe, Adrian J.; Crame, Andrew J.; and Borthwick, Alan D., 4,880,801, Cl. 514-215.000.
Wallis, Christopher J.; Finch, Harry; and Hallett, Peter, 4,880,800, Cl. 514-211.000.

Globe Products Inc.: *See—*
Lachey, Richard N., 4,880,173, Cl. 242-1.10R.

Gobel, Armin; Graff, Knut; Meier, Hans-Ulrich; and Patzschke, Hans-Peter, to 501 Herberts Gesellschaft mit Beschrankter. Aqueous coating compositions, a process for their preparation and method of using the same. 4,880,867, Cl. 524-507.000.

Goeckler, Heinz; and Alberty, Thomas, to ANT Nachrichtentechnik GmbH. Multicarrier demodulator. 4,881,222, Cl. 370-70.000.

Goeken, John D.: *See—*
Hollewed, Edward J.; Goeken, John D.; and Oldani, Jerome L., 4,881,254, Cl. 379-144.000.

Goertz, Hans-Helmut: *See—*
Klimesch, Roger G.; Bleckmann, Gerhard; Farwerck, Karl-Peter; Goertz, Hans-Helmut; and Schlemmer, Lothar, 4,880,585, Cl. 264-141.000.

Goffi, Italo, to Miroglio Tessile S.p.A. Dry transfer sheet. 4,880,678, Cl. 428-40.000.

Goodall, Brian L.; and Grotenhuis, Paulus A. M., to Shell Oil Company. Recovery of transition metals from aqueous solutions. 4,880,546, Cl. 210-699.000.

Goodrich, Jeffrey A.; Poe, Charles M., Jr.; and Prsha, Jeffrey A., to Scientific-Atlanta, Inc. Tachometer sensor using a lens system to a in sensing the rotational speed of an object. 4,880,966, Cl. 250-231.00R.

Goodwin, James G., Jr.: *See—*
Eri, Sigrid; Goodwin, James G., Jr.; Marcelin, George; and Riis, Trygve, 4,880,763, Cl. 502-302.000.

Goodwin, Vernon L., to Support Systems International, Inc. Fluidized patient support system. 4,879,777, Cl. 5-453.000.

Gordecki, Richard J., to Motorola, Inc. Battery housing. 4,880,712, Cl. 429-97.000.

Gordon, Gilbert, to Bioxy International, Ltd. Biocidal composition and method for disinfecting articles. 4,880,638, Cl. 424-662.000.

Gorlich, Lothar, to UTB Umwelttechnik Buchs AG. Method and apparatus for desulfurization of sulfur or hydrogen sulfide-containing gases. 4,880,606, Cl. 423-220.000.

Gortsema, Frank P.: *See—*
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., 4,880,760, Cl. 502-67.000.

Gosdowski, Gerhard: *See—*
Drexel, Peter; Erne, Hans; Gosdowski, Gerhard; Gross, Karl; Kirsten, Ulrich; and Leisner, Ernst, 4,880,265, Cl. 294-86.400.

Gose, William C.: *See—*
Hyche, Kenneth W.; and Gose, William C., 4,880,470, Cl. 106-271.000.

Gossler, Hans K.; and Guynn, Chester K. Pallets supported reinforced container. 4,880,141, Cl. 220-464.000.

Goto, Mitsuhiro: *See—*
Hamamura, Ken; Kawahara, Sei; and Goto, Mitsuhiro, 4,880,374, Cl. 425-185.000.

Gotoh, Taiji; Yamamoto, Hidetoshi; and Yamada, Kiyoshi, to Mie Hooro Co., Ltd. Method of joining pipes. 4,880,260, Cl. 285-382.200.

Gotou, Wataru: *See—*
Matsuda, Shigeki; Mori, Kazuhiko; Gotou, Wataru; and Ohnuki, Takahiro, 4,880,476, Cl. 148-253.000.

Goulette, Stephen L., to Mobil Oil Corporation. Roll unwind butt splicer. 4,880,178, Cl. 242-58.100.

Gourronc, Eugene, to Simon, Jean. Underwater painting machine comprising a paint application device with pulsatory movement associated with a rotary smoothing device. 4,879,966, Cl. 118-207.000.

Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. Socketing a semiconductor device. 4,880,386, Cl. 439-68.000.

Grach, Ayzik, to McNeil (Ohio) Corporation. Expansible chamber motor with snap-acting valve. 4,879,943, Cl. 91-224.000.

Graff, Knut: *See—*
Gobel, Armin; Graff, Knut; Meier, Hans-Ulrich; and Patzschke, Hans-Peter, 4,880,867, Cl. 524-507.000.

Graham, Kenneth; Geer, Kenton D.; and Bednarski, Katherine, to Hyde Athletic Industries Inc. Insole construction. 4,879,821, Cl. 36-44.000.

Grasel, Timothy G.; and Cooper, Stuart L., to Wisconsin Alumni Research Foundation. Biocompatible polyurethanes modified with lower alkyl sulfonate and lower alkyl carboxylate. 4,880,883, Cl. 525-454.000.

Graver Company, The: *See—*
Davis, Thomas A.; and Butterworth, Donald J., 4,880,513, Cl. 204-182.400.

Graves, Lee K., to Wickes Manufacturing Company. Adjustable lumbar support. 4,880,271, Cl. 257-284.000.

Graves, William H., Jr.; Wallace, Gary W.; Bradford, Bruce P.; Carpenter, Carolyn R.; Smith, Kenneth W.; and Toft, Howard C., to R. J. Reynolds Tobacco Company. Extruded tobacco materials. 4,880,018, Cl. 131-375.000.

Gray, Frank; and Stienbarger, LeRoy. Pedal operated vehicle with cam and cam follower drive assembly. 4,880,249, Cl. 280-253.000.

Gray, John D.: *See—*
Brault, Alfred F.; and Gray, John D., 4,880,588, Cl. 264-163.000.

Graziano, Victor, to Motorola, Inc. Antenna beam boundary detector for preliminary handoff determination. 4,881,082, Cl. 342-432.000.

Great Lakes Chemical Corporation: *See—*
Termine, Enrico J.; Faystritsky, Nicolai A.; and Borden, Dennis M., 4,880,862, Cl. 524-373.000.

Green, Lyel A. Disposable underpants. 4,880,423, Cl. 604-391.000.

Greenbaum, Bruce J.: *See—*
Hoffman, John N.; and Greenbaum, Bruce J., 4,880,266, Cl. 296-37.900.

Greene, David G., to Steelcase Inc. Programmable bed for machine tools and the like. 4,880,218, Cl. 269-21.000.

Greenstein, George M.: *See—*
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.

Greever, Richard G.: *See—*
Clark, Mark E.; Greever, Richard G.; Schmier, Larry J.; and Wong, Jerome D., 4,881,230, Cl. 371-20.100.

Gregory, William D., to Diotec Trust, Trustees of the. Frequency dependent identification of materials. 4,881,025, Cl. 324-61.00R.

Gressly, Andre : *See—*
von Arb, Hans-Peter; Durr, Ulrich; Gressly, Andre ; and Studer, Franz, 4,881,233, Cl. 372-35.000.

Greune, Christian, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Mounting for a sealing ring. 4,880,244, Cl. 277-174.000.

Griessbach, Robert: *See—*
Niedermayr, Erich; and Griessbach, Robert, 4,880,992, Cl. 250-561.000.

Griffin, Raymond T.: *See—*
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Grilliot, Mary I.: *See—*
Grilliot, William L.; and Grilliot, Mary I., 4,879,769, Cl. 2-312.000.

Grilliot, William L.; and Grilliot, Mary I. Firefighter's boot and trouser attachment. 4,879,769, Cl. 2-312.000.

Grobman, Warren D.: *See—*
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.

Groe, David E., to Sun Electric Corporation. Method and apparatus for emission testing. 4,881,183, Cl. 364-550.000.

Groenewold, William H. Simulated animal racing track apparatus. 4,880,235, Cl. 273-86.00R.

Groffman, David M.: *See—*
Allen, William M.; Sansom, Bernard F.; Wilson, Alan D.; Prosser, Havard J.; and Groffman, David M., 4,880,628, Cl. 424-605.000.

Grollier, Jean F.; Dubief, Claude; and Mondet, Jean, to L'Oreal. Use of partially acetylated polyvinyl alcohol as a foaming agent in compositions in the form of aerosols. 4,880,618, Cl. 424-43.000.

Grollier, Jean-Francois; Allec, Josiane; Fourcadier, Chantal; Rosenbaum, Georges; and Darmenton, Patrick, to Societe Anonyme dite: l'Oreal. Cosmetic composition for the treatment of the hair and skin

comprising a powder of flowers or flower tops and a cohesion agent. 4,880,621, Cl. 424-74.000.

Grosch, Peter: *See—*
Dorn, Karsten; Grosch, Peter; and Kremer, Ingo, 4,880,669, Cl. 427-210.000.

Grosjean, Pierre: *See—*
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Gross, Karl: *See—*
Drexel, Peter; Erne, Hans; Gosdowski, Gerhard; Gross, Karl; Kirsten, Ulrich; and Leisner, Ernst, 4,880,265, Cl. 294-86.400.

Gross, Miroslay K., to Eastman Kodak Company. Mount for an optical element. 4,880,301, Cl. 350-636.000.

Grotenhuis, Paulus A. M.: *See—*
Goodall, Brian L.; and Grotenhuis, Paulus A. M., 4,880,546, Cl. 210-699.000.

Grothaus, Ulrich; and Lagerpusch, Klaus, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt, Max Grundig Holland, Stiftung & Co. KG. Comb filter for the rejection of intertrack chromonance cross-talk. 4,881,134, Cl. 358-328.000.

Grubenmann, Arnold: *See—*
Bugnon, Philippe; Grubenmann, Arnold; Medinger, Bernhard; and Schaefle, Jean, 4,880,472, Cl. 106-493.000.

Grundig E.M.V. Elektro-Mechanische Versuchsanstalt, Max Grundig Holland, Stiftung & Co. KG: *See—*
Grothaus, Ulrich; and Lagerpusch, Klaus, 4,881,134, Cl. 358-328.000.

Grundman, Raphael: *See—*
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Grunwald, Peter-Hein. Overhead projector. 4,880,303, Cl. 353-122.000.

Gruppo Lepetit S.P.A.: *See—*
Cavalleri, Bruno; Turconi, Marco; and Tamborini, Giovanni, 4,880,789, Cl. 514-183.000.

Gsell, Thomas C.: *See—*
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GTE Government Systems Corporation: *See—*
Vaughn, Charles J., 4,881,040, Cl. 328-61.000.

GTE Laboratories Incorporated: *See—*
Wang, Da Y.; Kennedy, Daniel T.; and MacAllister, Burton W., Jr., 4,880,519, Cl. 204-425.000.

GTE Mobilnet Incorporated: *See—*
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GTE Products Corporation: *See—*
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,880,170, Cl. 241-5.000.
Kopatz, Nelson E.; Stermer, Philip E.; and Pruyne, Lori S., 4,880,605, Cl. 422-232.000.
Passmore, Edmund M., 4,881,009, Cl. 313-631.000.

GTE Valenite Corporation: *See—*
Stashko, Daniel R., 4,880,338, Cl. 407-114.000.

Gudmestad, Ragnar: *See—*
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Guenes, Uenal: *See—*
Stuecker, Erwin; Hofer, Gerhard; Koch, Dietmar; and Guenes, Uenal, 4,881,030, Cl. 324-209.000.

Guesnet, Patrice; Kawamura, Tetsuchi; Savin, Gerard; Poncet, Sabine; and Castera, Charles, to Societe Nationale Elf Aquitaine (Production). Water-soluble additives having extreme pressure effect for aqueous functional fluids, functional fluids and concentrated aqueous compositions containing the additives. 4,880,552, Cl. 252-34.000.

Guffey, Timothy B.; Abe, Susan S.; Talkington, Sherry R.; and Mijac, Marko D., to Procter & Gamble Company, The. Shortening compositions containing polyol polyesters. 4,880,657, Cl. 426-601.000.

Guggenheim, Thomas L.; and Guiles, Joseph W., to General Electric Company. Cyclic polyphenylene ether-polycarbonate oligomers. 4,880,899, Cl. 528-370.000.

Guiles, Joseph W.: *See—*
Guggenheim, Thomas L.; and Guiles, Joseph W., 4,880,899, Cl. 528-370.000.

Gundlach, Robert W.: *See—*
Tam, Man C.; Gundlach, Robert W.; and Pundsack, Arnold L., 4,880,715, Cl. 430-41.000.

Gunze Limited: *See—*
Okada, Toshihiko; Yagi, Toshifumi; and Suzuki, Satoshi, 4,879,886, Cl. 66-151.000.

Gurit Essex AG: *See—*
Braendle, Jurg G.; and Wolfgang, Saur, 4,879,853, Cl. 52-208.000.

Guth, Christian: *See—*
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Guthrie, Roger T.: *See—*
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Gutierrez, Antonio: *See—*
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Guttinger, Peter: *See—*
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Guynn, Chester K.: *See—*
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GyCor International Ltd.: *See—*
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H. C. Spinks Clay Company Inc.: *See—*
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H. J. Langen & Sons Limited: *See—*
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Haag, Gottlob: *See—*
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Habara, Hideaki: *See—*
Sugimori, Teruhiko; Tajiri, Noriyuki; Suzuki, Fumio; Habara, Hideaki; Fukuda, Yutaro; and Sato, Haruki, 4,880,877, Cl. 525-84.000.

Haberer, Herbert, to Siemens Aktiengesellschaft. Circuit arrangement for the transmission of data signals. 4,881,242, Cl. 375-118.000.

Haberstroh, Karl. Device for cleaning cans. 4,880,021, Cl. 134-62.000.

Habicht, Siegfried; Reppert, Rainer; and Hocker, Eitel-Friedrich, to Schuco International GmbH & Co. Impact-impeding pane/frame structure. 4,879,957, Cl. 109-79.000.

Habraken, Egidius A. P.: *See—*
Woudsma, Roberto; Chong, David C. H.; McSweeney, Brian T.; Borgers, Stephanus M. C.; and Habraken, Egidius A. P., 4,881,192, Cl. 364-725.000.

Habrich, Reiner; and Bayer, Heiner, to Siemens Aktiengesellschaft. Method and apparatus for processing UV-hardenable reaction resin compounds. 4,880,662, Cl. 427-54.100.

Haga, Toru: *See—*
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,880,925, Cl. 544-105.000.

Haggerty, John A., to B. F. Goodrich Company, The. Bearing assembly. 4,880,319, Cl. 384-215.000.

Hagglund, Hans; Ericsson, Lars; and Wiklund, Rudolf, to Geotronics Metaltech AB. Device for detecting the level of the slag in a metal pool. 4,880,212, Cl. 266-94.000.

Hagiwara, Takashi: *See—*
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Haifa Chemicals Limited: *See—*
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Hailpern, Brent T.; Hoevel, Lee W.; and Shapiro, Eugene, to International Business Machines Corporation. Multi-microprocessor for controlling shared memory. 4,881,164, Cl. 364-200.000.

Haines, Derrick J.; and Marsh, Harry, to British Aerospace plc. Fluid film journal bearings. 4,880,320, Cl. 384-215.000.

Hair, Robert A.: *See—*
Lambropoulos, George; Pitera, Kenneth R.; and Hair, Robert A., 4,881,148, Cl. 361-172.000.

Hakansson, Lars A. H. Apparatus for treating small items. 4,880,022, Cl. 134-120.000.

Hall, Garth O.; and Tengler, Harvey N., to Bostrom Seating, Inc. Constant natural frequency, mechanical spring seat suspension. 4,880,201, Cl. 248-575.000.

Hall, W. Reginald: *See—*
Hatzidimitriu, Stratos E.; and Hall, W. Reginald, 4,880,647, Cl. 426-239.000.

Hallett, Peter: *See—*
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Halliburton Company: *See—*
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Halliburton Services: *See—*
Bowlin, David A.; and Seyman, Michael J., 4,880,468, Cl. 106-98.000.

Halskov, Soren. Pharmaceutical composition and method for the treatment of colitis ulcerosa and crohn's disease by oral administration. 4,880,794, Cl. 514-166.000.

Halushka, Roman A.: *See—*
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Baker, Ross G., Jr.; Calfee, Richard V.; Haluska, Edward A.; and Whistler, Stephen J., 4,880,004, Cl. 128-419.0PG.

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Eriksson, Rolf; Hammarlund, Gudmar; and Sundqvist, Lars-Erik, 4,880,395, Cl. 439-507.000.

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Kohno, Yuichiro; and Hara, Akio, 4,880,707, Cl. 428-565.000.

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Harak, Arnold E.: *See*—
Westhoff, James D.; and Harak, Arnold E., 4,880,528, Cl. 208-409.000.

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Sanborn, James A.; and Boan, Bobby J., 4,880,570, Cl. 252-512.000.
Sanders, Thomas J., 4,881,111, Cl. 357-34.000.
Walker, Watson F.; and Sutherland, Jack L., 4,881,245, Cl. 375-38.000.

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Jetter, Neil R., 4,881,010, Cl. 315-111.810.

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Poole, James E.; and Hartman, Marvis E., 4,880,849, Cl. 522-10.000.

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Hatoh, Hisamitu: *See*—
Ishida, Yasumasa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.

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Hayes, Richard A., to Du Pont de Nemours, E. I., and Company. Polyimide gas separation membranes. 4,880,442, Cl. 55-16.000.
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Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L. Method and apparatus for relining a refractory lined vessel. 4,880,211, Cl. 266-44.000.
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Hecq, Andre ; and Thomas, Jean-Francois, to Glaverbel. Matted glass. 4,880,677, Cl. 428-38.000.
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Hirai, Hiroyuki; and Yabuki, Yoshiharu, to Fuji Photo Film Co., Ltd. Photographic silver halide photosensitive material. 4,880,723, Cl. 430-218.000.

Hirai, Hiroyuki; and Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Color image forming process utilizing substantially water-insoluble basic metal compounds and complexing compounds. 4,880,725, Cl. 430-373.000.

Hirai, Kazumi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; and Hori, Ichiroh, to Matsushita Electrical Industrial Co., Ltd. Heat cooking oven having flat heater units on the outside of the walls thereof. 4,880,952, Cl. 219-10.55B.

Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, to Sumitomo Naugatuck Co., Ltd. Resin of polycarbonate and graft copolymer of unsaturated epoxy monomer and ethylene-α-olefin base rubber. 4,880,874, Cl. 525-67.000.

Hirai, Yukio: *See*—
Kawamura, Shuzo; and Hirai, Yukio, 4,880,174, Cl. 242-18.0DD.

Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, to Mitsubishi Paper Mills; and Asahi Kasei Kogyo Kabushiki Kaisha. Recording material. 4,880,767, Cl. 503-217.000.

Hirano, Shigeo: *See*—
Heki, Tatsuo; Inoue, Noriyuki; and Hirano, Shigeo, 4,880,729, Cl. 430-410.000.

Hirano, Taichi, to Prince Tsushinkogyo Limited. Sound effector. 4,879,937, Cl. 84-699.000.

Hirth, Michael; and Wiegart, Norbert, to BBC Brown Boveri AG. Process for separating and/or reacting particles. 4,880,685, Cl. 423-210.000.

Hirukawa, Yoshinori: *See*—
Matsunami, Hidenobu; Tsuruda, Takahiro; Hitosugi, Naoki; and Hirukawa, Yoshinori, 4,880,644, Cl. 426-46.000.

Hisamitsu, Hironori: *See*—
Yoshioka, Kenichiro; and Hisamitsu, Hironori, 4,880,792, Cl. 425-190.000.

Hishi, Wakichiro: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.

Hitachi Automotive Engineering Co., Ltd.: *See*—
Itakura, Tomiya; and Kamifuji, Hiroshi, 4,879,982, Cl. 123-339.000.

Hitachi Koki Co., Ltd.: *See*—
Kurosawa, Makoto; and Igarashi, Kenichi, 4,879,947, Cl. 101-93.040.

Hitachi, Ltd.: *See*—
Chinone, Naoki; Uomi, Kazuhisa; Fukuzawa, Tadashi; Matsueda, Hideaki; Kajimura, Takashi; and Ohtoshi, Tsukuru, 4,881,235, Cl. 372-45.000.
Chinone, Naoki; Uomi, Kazuhisa; Fukuzawa, Tadashi; Matsueda, Hideaki; and Kajimura, Takashi, 4,881,238, Cl. 372-68.000.
Hamada, Hozumi; and Nakano, Hiraku, 4,881,193, Cl. 364-761.000.
Imoto, Katsuyuki; Takase, Akihiko; Takai, Atsushi; Aoki, Satoshi; Yoshiya, Tsutomu; and Yamada, Shoji, 4,880,289, Cl. 350-96.180.
Inagami, Yasuhiro; Nakagawa, Takayuki; Tamaki, Yoshiko; and Nagashima, Shigeo, 4,881,168, Cl. 364-200.000.
Ishida, Yasunassa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.
Itakura, Tomiya; and Kamifuji, Hiroshi, 4,879,982, Cl. 123-339.000.
Kinoshita, Taizo; Tanaka, Satoshi; Tanaka, Hirotoshi; Kotera, Nobuo; and Nagata, Minoru, 4,881,044, Cl. 330-253.000.
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.
Kumazawa, Tetsuo; Shimaoka, Makoto; Fukuda, Kazuyuki; and Adachi, Eiichi, 4,880,290, Cl. 350-96.200.
Matsuda, Masami; Funabashi, Kiyomi; Nishi, Takashi; Komori, Itaru; Baba, Tsutomu; Yusa, Hideo; Uchida, Shunsuke; Adachi, Tetsuro; Ohsumi, Katsumi; and Sato, Tomohiro, 4,880,595, Cl. 376-313.000.
Sasaki, Hisao; Terada, Matsuaki; Matsui, Susumu; Kawakita, Kenji; Kashio, Jiro; Baba, Shiro; Akao, Yasushi; and Okochi, Toshio, 4,881,167, Cl. 364-200.000.
Shiraishi, Kazuhisa; Nakagoshi, Kazuo; and Ogawa, Takuji, 4,881,136, Cl. 360-25.000.
Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, 4,880,694, Cl. 428-336.000.
Teranishi, Mitsuo; Urushidani, Haruo; Toriya, Hajime; and Ebine, Shoji, 4,880,354, Cl. 416-95.000.
Uesugi, Masaki, 4,881,138, Cl. 360-96.500.
Ushio, Jiro; Miyazawa, Osamu; Yokono, Hitoshi; and Tomizawa, Akira, 4,880,464, Cl. 106-1.050.
Yamauchi, Yukiji; Tsukamoto, Nobuo; and Koya, Masahiro, 4,881,271, Cl. 455-56.000.
Yokouchi, Hisatake; Takahashi, Fumitaka; and Tsuneoka, Masayuki, 4,881,124, Cl. 358-111.000.
Yuito, Isamu; Moriwaki, Eijin; Shiiki, Kazuo; Hamakawa, Yoshihiro; and Takano, Hisashi, 4,881,144, Cl. 360-125.000.

Hitachi, Ltd. & Hitachi Microcomputer Engineering, Ltd.: *See*—
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,881,201, Cl. 365-189.090.

Hitachi Medical Corporation: *See*—
Yokouchi, Hisatake; Takahashi, Fumitaka; and Tsuneoka, Masayuki, 4,881,124, Cl. 358-111.000.

Hitachi Metals, Ltd.: *See*—
Uchida, Norimasa, 4,880,461, Cl. 75-238.000.

Hitachi Power Engineering Co., Ltd.: *See*—
Teranishi, Mitsuo; Urushidani, Haruo; Toriya, Hajime; and Ebine, Shoji, 4,880,354, Cl. 416-95.000.

Hitec Co., Ltd.: *See*—
Kasai, Minoru; and Nakamura, Minoru, 4,880,105, Cl. 198-465.400.

Hitosugi, Naoki: *See*—
Matsunami, Hidenobu; Tsuruda, Takahiro; Hitosugi, Naoki; and Hirukawa, Yoshinori, 4,880,644, Cl. 426-46.000.

Hlavka, Joseph J.: *See*—
Child, Ralph G.; Bitha, Panayiota; Hlavka, Joseph J.; and Lin, Yang-I, 4,880,790, Cl. 514-184.000.

Ho, Thoi; and Kao, Che-I, to Dow Chemical Company, The. Process for preparing aromatic polycarbonates. 4,880,897, Cl. 528-199.000.

Hochstrasser, Robin M.: *See*—
Cornelius, Paul A.; Hochstrasser, Robin M.; Kallenbach, Neville R.; Rubin, Harvey; and Todaro, George J., 4,880,512, Cl. 204-157.610.

Hocker, Eitel-Friedrich: *See*—
Habicht, Siegfried; Reppert, Rainer; and Hocker, Eitel-Friedrich, 4,879,957, Cl. 109-79.000.

Hodgson, William J., Jr.: *See*—
Hazelton, Donald R.; Laurent, Douglas J.; Locke, Lawrence K.; and Hodgson, William J., Jr., 4,880,682, Cl. 428-152.000.

Hoechst Aktiengesellschaft: *See*—
Blocker, Erich, 4,880,860, Cl. 524-94.000.
Peters, Dieter, 4,880,612, Cl. 423-413.000.
Weithmann, Klaus U.; and Seiffge, Dirk, 4,880,791, Cl. 514-161.000.
Wohlleben, Wolfgang; Schulte, Agnes; and Puhler, Alfred, 4,880,746, Cl. 435-253.500.
Zimmermann, Wolfgang; and Harreus, Albrecht, 4,880,870, Cl. 524-31.000.

Hoechst Celanese: *See*—
McNally, Donal; LaNieve, H. Leslie; and Costanzo, Jerome L., 4,880,866, Cl. 524-504.000.

Hoechst Celanese Corporation: *See*—
Kohn, Rachel S., 4,880,699, Cl. 428-333.000.
Rudd, David; and Caines, R. Scott, 4,880,695, Cl. 428-341.000.
Sheehan, Michael T.; and Shah, Bakulesh N., 4,880,487, Cl. 156-327.000.
Stein, Harvey L., 4,880,843, Cl. 521-98.000.
Walls, John E.; and Dhillon, Major S., 4,880,555, Cl. 252-143.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Effland, Richard C.; and Klein, Joseph T., 4,880,822, Cl. 514-339.000.
Schonafinger, Karl; and Hu Ong, Helen, 4,880,818, Cl. 514-313.000.

Hoeptner, Herbert W.: *See*—
Panzica, Ignatius J.; and Hoeptner, Herbert W., 4,880,280, Cl. 301-105.00B.

Hoevel, Lee W.: *See*—
Hailpern, Brent T.; Hoevel, Lee W.; and Shapiro, Eugene, 4,881,164, Cl. 364-200.000.

Hofer, Gerhard: *See*—
Stuecker, Erwin; Hofer, Gerhard; Koch, Dietmar; and Guenes, Uenal, 4,881,030, Cl. 324-209.000.

Hoffman, John N.; and Greenbaum, Bruce J. Vehicle ash tray. 4,880,266, Cl. 296-37.900.

Hoffmann, Michael R.; Arnold, Robert G.; and Stephanopoulos, Gregory, to California Institute of Technology. Microbial reduction of iron ore. 4,880,740, Cl. 435-168.000.

Hoffmeister, Hermann; Puvogel, Klaus; and Schniederjan, Reinhold, to Hydromatik GmbH. Summation power output regulating system for at least two hydrostatic transmissions. 4,880,359, Cl. 417-216.000.

Hofmeister, Peter: *See*—
Seppelt, Wolfgang; Hofmeister, Peter; and Kuenast, Christoph, 4,880,837, Cl. 514-594.000.

Hojo, Takeshi; Yamamoto, Kanshi; Kawada, Shinichi; Murabayashi, Kazushige; Akimoto, Mamoru; and Fukano, Michio, to Tokyo Keiki Co., Ltd. Gyro compass. 4,879,918, Cl. 74-5.470.

Hoksaas, Harald, to Impex Production & Development A/S (Ltd.). Fluid indicator for a containment vessel. 4,880,982, Cl. 250-577.000.

Holbert, Marvin L., Jr., to Bassett, Max. Pressure compensation multi tubular safety joint. 4,880,257, Cl. 285-2.000.

Holck, Jens-Peter: *See*—
Bohm, Erwin; Holck, Jens-Peter; Kampe, Wolfgang; Leinert, Herbert; Muller-Beckmann, Bernd; and Strein, Klaus, 4,880,805, Cl. 514-237.500.

Holcomb, Grove R.; and Douglas, Bruce M. Adjustable form brace. 4,880,203, Cl. 249-24.000.

Holcombe, Cressie E.; Dykes, Norman L.; and Meek, Thomas T., to United States of America, Energy. Method for heat treating and sintering metal oxides with microwave radiation. 4,880,578, Cl. 264-26.000.

Holland, G. Neil: *See*—
Denison, Kenneth S.; Holland, G. Neil; and DeMeester, Gordon D., 4,881,033, Cl. 324-309.000.

Holland, John H., to John and Martin Holland and Associates. Well pump system. 4,880,363, Cl. 417-390.000.

Holland, John H.; and Burks, Arthur W., to University of Michigan, The Regents of the. Method of controlling a classifier system. 4,881,178, Cl. 364-513.000.

Holle, Bernd-Michael: *See*—
Zander, Hans-Gunter; Bornefeld, Horst; and Holle, Bernd-Michael, 4,880,169, Cl. 241-5.000.

Hollewed, Edward J.; Goeken, John D.; and Oldani, Jerome L., to GTE Mobilnet Incorporated. Hand-held pay telephone and holder. 4,881,254, Cl. 379-144.000.

Hollingsworth, Fred, III; and Angus, Julian G., to Omni Films International, Inc. Point-of-view motion simulator system. 4,879,849, Cl. 52-10.000.

Holmes, Alan W.: *See*—
Burrowes, David E.; and Holmes, Alan W., 4,881,070, Cl. 340-870.020.

Holmes, Martin J.; and Harris, Ron, to Iolab Corporation. Lens insertion instrument. 4,880,000, Cl. 128-303.00R.

Holroyd, Nigel J. H.; Hepples, Warren; and Scamans, Geoffrey M., to Alcan International Limited. Welded aluminum alloy composite. 4,880,709, Cl. 428-654.000.

Holthoff, Helmut; and Moltner, Hermann, to Kocks Technik GmbH & Co. Gearing for driving the rolls of a roll train. 4,879,924, Cl. 74-799.000.

Holtz, Joachim; Salama, Samir; and Salzmann, Theodor, to Siemens Aktiengesellschaft. Switching-relieved low-loss three-level inverter. 4,881,139, Cl. 363-58.000.

Holzner, Gunter; Kittner, Peter; and Blake, Anthony, to Firmenich S.A. Process for flavouring an edible composition. 4,880,649, Cl. 426-302.000.

Homan, Morio; Sugie, Nizo; Yoshimura, Masakiyo; and Shirakawa, Yoshikazu, to Shionogi & Co., Ltd. Three layer composition for stablizing a denture. 4,880,702, Cl. 428-354.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; Kubota, Osamu; Yano, Shunji; Tateishi, Fusao; Noda, Etsuo; Yamaguchi, Koji; and Endo, Tsuneo, 4,880,351, Cl. 415-164.000.
Inoue, Takeshi; Funabashi, Hiroshi; and Nakagawa, Yukihiro, 4,880,078, Cl. 181-232.000.
Nakamura, Katsumi; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,795, Cl. 29-214.000.
Nakamura, Katsumi; Koide, Shigeyuki; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,796, Cl. 29-214.000.
Sekizaki, Satoshi, 4,879,919, Cl. 74-337.500.
Yoshioka, Teruo; Nakano, Shoji; and Sato, Yutaka, 4,879,797, Cl. 29-240.000.

Honda, Kazuo: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 4,880,841, Cl. 514-654.000.

Honda, Norio: *See*—
Nakamura, Katsumi; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,795, Cl. 29-214.000.
Nakamura, Katsumi; Koide, Shigeyuki; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,796, Cl. 29-214.000.

Honda, Toshio: *See*—
Yoshikawa, Masato; Kusano, Yukihiro; Naito, Kazuo; Honda, Toshio; and Hata, Tomonobu, 4,880,515, Cl. 204-192.120.

Hondulas, John. Apparatus and system for treating waste water and sludge. 4,880,533, Cl. 210-104.000.

Honeycomb Systems, Inc.: *See*—
Randall, Kenneth R., Jr.; and Parent, Laurent R., 4,880,168, Cl. 239-553.500.

Honeywell Bull Inc.: *See*—
Lajos, Jaroslav, 4,881,132, Cl. 358-296.000.

Honeywell Inc.: *See*—
Bartels, James L; Patton, Paul B.; Kidder, Kenneth B.; and Gaskell, Alfred J., 4,880,376, Cl. 431-12.000.
Keen, Joseph M.; and Schiller, David S., 4,881,060, Cl. 340-511.000.

Honikman, Terence C.: *See*—
Cumes, David M.; and Honikman, Terence C., 4,880,408, Cl. 604-36.000.

Hope, Michael J.: *See*—
Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.

Horak, Vladimir. Increasing the accuracy of liquid volume measurements utilizing liquid level sensing. 4,880,039, Cl. 141-1.000.

Hori, Ichiroh: *See*—
Hirai, Kazumi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; and Hori, Ichiroh, 4,880,952, Cl. 219-10.55B.

Horie, Kiyoshi, to Computer Services Corporation. Optical recording medium and method for correcting angular deviation thereof. 4,881,215, Cl. 369-44.000.

Horikawa, Kenichi: *See*—
Meguro, Hiroshi; Yamamoto, Yoshinori; Ohyama, Masao; Horikawa, Kenichi; Mizusawa, Shigeru; and Kawakami, Kenji, 4,881,137, Cl. 360-96.500.

Horiuchi, Tetsuo; and Inoue, Yuichi, to Nitto Electric Industrial Co., Ltd. Dermal bandage and dermal preparation. 4,880,416, Cl. 604-307.000.

Horley, Susan M.: *See*—
Abboud, George E.; Such, Christopher H.; Horley, Susan M.; and Waters, Julian A., 4,880,931, Cl. 544-316.000.

Horton, Robert L.; and Lakey, George V., to Phillips Petroleum Company. Recovering mineral values from ores. 4,880,607, Cl. 423-20.000.

Horvath, Lazlo: *See*—
Palotas, Laszlo ; Laszlo, Geza; Horvath, Lazlo; Baria, Arpadne ; Marion, Barnabas; and Szarka, Ferencne , 4,880,208, Cl. 251-356.000.

Hoshino, Akira; Saji, Mikio; and Yamaguchi, Isamu, to Dainichiseika Color & Chemicals Mfg. Co., Ltd. Deodorizing polyolefin resin compositions and formed deodorizing articles containing a mixture of a zinc compound and a sulfate of aluminum. 4,880,852, Cl. 523-102.000.

Hosoda, Hiroshi: *See*—
Aso, Toshiyuki; and Hosoda, Hiroshi, 4,880,957, Cl. 219-69.120.

Hosoda, Tomohiko: *See*—
Makino, Nobuhiko; Tamura, Kimio; Miyazaki, Hiroharu; Hosoda, Tomohiko; and Nakagawa, Fumio, 4,880,282, Cl. 303-116.000.

Hosoi, Yuichi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,880,987, Cl. 250-484.100.

Howe, Blair E.: *See*—
Bagwell, James T.; and Howe, Blair E., 4,880,111, Cl. 206-209.100.

Howells, Roger A.; Stoner, George H.; and Stockunas, Joseph, to Air Products and Chemicals, Inc. Gas atomization nozzle for metal powder production. 4,880,162, Cl. 239-406.000.

Hsueh, Fu-Cheng. Fuse holder for holding a flat-type fuse block. 4,880,398, Cl. 439-622.000.

Hu Ong, Helen: *See*—
Schonafinger, Karl; and Hu Ong, Helen, 4,880,818, Cl. 514-313.000.

Huang, Yi-Chao. Fully automatic speed-reading trainer. 4,880,385, Cl. 434-181.000.

Hub, Hans-Henning; Simon, Georg N.; Heinz, Gerhard; Ziegler, Walter; and Sadlowski, Juergen, to BASF Aktiengesellschaft. Thermoplastic polyester molding materials having low-temperature impact strength. 4,880,876, Cl. 525-67.000.

Hubbell Incorporated: *See*—
Jorgensen, Robert W., 4,880,128, Cl. 220-3.900.

Hubbs, John C.: *See*—
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne; Hubbs, John C.; and Foster, Charles H., 4,880,778, Cl. 514-12.000.

Hubert-Sternback, Francoise: *See*—
Chombert, Dominique; and Hubert-Sternback, Francoise, 4,880,089, Cl. 190-18.00R.

Hudgins, J. S. Drop dispenser which automatically stirs the contents of the dispenser when the cap is removed. 4,880,146, Cl. 222-192.000.

Hugenberger, Scott G.: *See*—
Savins, J. George; Hugenberger, Scott G.; and Wilson, Peggy M., 4,880,444, Cl. 55-36.000.

Hughes Aircraft Company: *See*—
Apfel, Steven L., 4,880,185, Cl. 244-135.00B.
Braatz, Paul O.; and Efron, Uzi, 4,881,110, Cl. 357-30.000.
Brackmann, Walter H., Jr.; Van Gelder, Cornelius A.; and Halushka, Roman A., 4,880,390, Cl. 439-204.000.
Cohn, David B.; and Sasaki, Gregory R., 4,880,978, Cl. 250-332.000.
Moss, Gaylord E., 4,880,287, Cl. 350-3.850.
Perusse, Eugene T.; and Hammer, Eugene L., 4,881,023, Cl. 323-266.000.
Rockwell, David A.; Mangir, Metin S.; White, Jeffrey O.; and Jones, Dennis C., 4,880,295, Cl. 350-354.000.

Hull, Harold L.; and Tafte, Althea P. Brassiere and/or attachment. 4,879,766, Cl. 2-101.000.

Humonics, Inc.: *See*—
Patterson, Dwight; and Levine, Neil A., 4,879,907, Cl. 73-861.050.

Hums, Erich, to Siemens Aktiengesellschaft. Combustion plant with a device for reducing nitrogen oxides in flue gases. 4,880,378, Cl. 431-170.000.

Hunsmann, Gerhard: *See*—
Eckstein, Fritz; Hunsmann, Gerhard; and Hartmann, Heinz, 4,880,782, Cl. 514-45.000.

Hunt, Mack W., to Amoco Corporation. Preparation of high base calcium sulfonates. 4,880,550, Cl. 252-33.000.

Hunt, Rowland D.: *See*—
Gardner, Kenneth; and Hunt, Rowland D., 4,879,848, Cl. 52-8.000.

Hurtgen, Jerome P., to General Electric Company. Apparatus for connecting multiple windings. 4,880,391, Cl. 439-221.000.
Hutchings, Richard S., to Drackett Company, The. Aqueous alkali metal halogenite compositions containing a colorant. 4,880,556, Cl. 252-156.000.
Hwang, Sheng-Lee. Game device. 4,880,236, Cl. 273-113.000.
Hwang, Wei: *See*—
Davari, Bijan; Hwang, Wei; and Lu, Nicky C., 4,881,105, Cl. 357-23.400.
Hyche, Kenneth W.; and Gose, William C., to Eastman Kodak Company. Aqueous additive systems, methods and polymeric particles. 4,880,470, Cl. 106-271.000.
Hyde Athletic Industries Inc.: *See*—
Graham, Kenneth; Geer, Kenton D.; and Bednarski, Katherine, 4,879,821, Cl. 36-44.000.
Hydromatik GmbH: *See*—
Hoffmeister, Hermann; Puvogel, Klaus; and Schniederjan, Reinhold, 4,880,359, Cl. 417-216.000.
Hylsa, S.A. de C.V.: *See*—
Martinez-Vera, Enrique R.; and Becerra-Novoa, Jorge O., 4,880,458, Cl. 75-35.000.
I.D.R. B.V.: *See*—
Weber, Rene , 4,880,383, Cl. 433-189.000.
Iannuzzelli, Vincent F.: *See*—
Burnett, Thomas W.; Clary, Thomas R.; Iannuzzelli, Vincent F.; and Kremer, Carl P., Jr., 4,880,989, Cl. 250-506.100.
IBC Corporation: *See*—
Stikeleather, Allan; and Blake, Geoffrey, 4,880,387, Cl. 439-98.000.
Ichiba, Masao: *See*—
Itou, Tsukasa; Kawase, Ryuji; Morioka, Yuji; and Ichiba, Masao, 4,880,435, Cl. 29-623.500.
Ichijima, Seiji: *See*—
Shiba, Keisuke; Ichijima, Seiji; Sakanoue, Kei; and Taguchi, Seiichi, 4,880,726, Cl. 430-376.000.
Ichikawa, Kenji, to Ikeda Bussan Co., Ltd. Power reclining device of seat. 4,880,274, Cl. 297-362.000.
Ichiki, Mikio: *See*—
Hamamoto, Atsushi; and Ichiki, Mikio, 4,879,843, Cl. 49-158.000.
Ichimura, Yoshiaki; Ishizuka, Shinichi; Komoto, Mitsuo; and Umesato, Shoji, to Japan Aviation Electronics Industry, Limited; and NEC Corporation. Socket. 4,880,399, Cl. 439-689.000.
ICI Americas Inc.: *See*—
Thomas, Arthur K., 4,880,872, Cl. 525-43.000.
Trainor, Diane A.; and Stein, Mark M., 4,880,780, Cl. 514-18.000.
ICI Australia Operations Proprietary Ltd.: *See*—
Dowing, Richard; Paull, Jolanta; and Vince, David, 4,879,952, Cl. 102-331.000.
ICRF (Patents) Limited: *See*—
Thorpe, Philip E., 4,880,935, Cl. 546-281.000.
Ida, Kazunaga: *See*—
Kawanabe, Yoshihiro; and Ida, Kazunaga, 4,881,041, Cl. 328-112.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Otsubo, Kazunari; Ezoe, Motonobu; Ago, Hideo; and Yamamoto, Koji, 4,880,896, Cl. 528-196.000.
Igarashi, Kenichi: *See*—
Kurosawa, Makoto; and Igarashi, Kenichi, 4,879,947, Cl. 101-93.040.
Ih, Charles C., to University of Delaware. Making a holographic optical element using a computer-generated-hologram. 4,880,286, Cl. 350-1.100.
Iiyama, Kiyotaka; and Hayakawa, Kunio, to Ricoh Company, Ltd. Coloring phthalide compounds, method of producing the compounds and recording materials using any of the compounds as coloring component. 4,880,762, Cl. 503-220.000.
Ikeda, Atsushi: *See*—
Ohara, Sosaburo; Ikeda, Atsushi; Shinohara, Seigo; and Kijima, Tetsuo, 4,880,557, Cl. 252-174.150.
Ikeda Bussan Co., Ltd.: *See*—
Ichikawa, Kenji, 4,880,274, Cl. 297-362.000.
Yamazaki, Hiroshi; Hara, Toshiyuki; Tanaka, Yuji; and Mouri, Takayuki, 4,880,264, Cl. 292-226.000.
Ikeda, Hayato; Ohta, Kazuhiro; and Kawamura, Hisato, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Multi-piston swash plate type compressor with arrangement for internal sealing and for uniform distribution of refrigerant to cylinder bores. 4,880,361, Cl. 417-269.000.
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Ikegami, Toru: *See*—
Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, 4,880,986, Cl. 250-484.100.
Ikuta, Eishi: *See*—
Imade, Shinichi; Shionoya, Kazunori; Ikuta, Eishi; Taguchi, Koji; Nishiyama, Toyoo; Wakamatsu, Seiichi; and Nagasaki, Tatsuo, 4,880,011, Cl. 128-662.060.
Ildvaco Engineering A/S: *See*—
Vennike, Torben, 4,879,949, Cl. 101-157.000.
Imada, Kunihiko: *See*—
Harada, Naoki; Miyamoto, Tetsuya; Imada, Kunihiko; and Omura, Takashi, 4,880,434, Cl. 8-549.000.
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Imagawa, Masao: *See*—
Kiso, Yoshihisa; Matsunaga, Yuuichi; and Imagawa, Masao, 4,880,942, Cl. 549-228.000.
Imai, Hajime: *See*—
Kito, Shozo; Harada, Shoichi; Imai, Hajime; Ohta, Hisatoshi; Suzuki, Masamitsu; and Muramatsu, Tadao, 4,880,092, Cl. 192-4.00A.
Imai, Hitoshi: *See*—
Tadokoro, Michihiro; Imai, Hitoshi; and Okada, Kazuo, 4,881,204, Cl. 369-46.000.
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, to Yamanouchi Pharmaceutical Co., Ltd. Process of producing phenethylamine derivatives. 4,880,841, Cl. 514-654.000.
Imai, Tamotsu; and Abrevaya, Hayim, to UOP. Dehydrogenation catalyst and process. 4,880,764, Cl. 502-326.000.
Imamura, Masanaga: *See*—
Mochizuki, Hidehiro; Imamura, Masanaga; Suzuki, Akira; Shimada, Masaru; and Uemura, Hiroyuki, 4,880,768, Cl. 503-227.000.
Imo Industries, Inc.: *See*—
Rando, Joseph D., 4,880,990, Cl. 250-577.000.
Imoto, Katsuyuki; Takase, Akihiko; Takai, Atsushi; Aoki, Satoshi; Yoshiya, Tsutomu; and Yamada, Shoji, to Hitachi, Ltd. Two-way optical transmission system. 4,880,289, Cl. 350-96.180.
Imperial Chemical Industries PLC: *See*—
Abboud, George E.; Such, Christopher H.; Horley, Susan M.; and Waters, Julian A., 4,880,931, Cl. 544-316.000.
Hardwick, Roy, 4,879,890, Cl. 72-62.000.
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,880,457, Cl. 71-92.000.
Tucker, Howard, 4,880,839, Cl. 514-613.000.
Impex Production & Development A/S (Ltd.): *See*—
Hoksaas, Harald, 4,880,982, Cl. 250-577.000.
Inagami, Yasuhiro; Nakagawa, Takayuki; Tamaki, Yoshiko; and Nagashima, Shigeo, to Hitachi, Ltd. Vector processor with vector data compression/expansion capability. 4,881,168, Cl. 364-200.000.
Indrebo, Leidulf. Device for the transfer of articles from a first to a second conveyor. 4,880,102, Cl. 198-418.300.
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Boehnlein, Albert J.; and Harding, Kevin G., 4,880,991, Cl. 250-560.000.
Ingendoh, Axel: *See*—
Lindel, Hans; Ingendoh, Axel; Berschauer, Friedrich; de Jong, Anno; and Scheer, Martin, 4,880,840, Cl. 514-645.000.
Ingersoll-Rand Company: *See*—
Capp, F. William; Gerhardt, Don J.; and Little, Randal A., 4,881,055, Cl. 337-404.000.
Murphy, Bernard J., 4,880,306, Cl. 356-153.000.
Innofinance Altalanos Innovacios Penzintezet: *See*—
Novak, Tibor, 4,880,630, Cl. 424-195.100.
Resli, Istvan; Takacs, Tibor; Damjanovich, Sandor; Gaspar, Rezso; Tron, Lajos; Szollosi, Janos; and Matko, Janos, 4,880,732, Cl. 435-29.000.
Innovative Solutions & Support, Inc.: *See*—
Hedrick, Geoffrey S. M., 4,881,006, Cl. 313-450.000.
Inomata, Masaichi: *See*—
Uesugi, Mitsuaki; Inomata, Masaichi; and Komine, Isamu, 4,881,126, Cl. 358-160.000.
Inoue, Kazuo; Kubota, Osamu; Yano, Shunji; Tateishi, Fusao; Noda, Etsuo; Yamaguchi, Koji; and Endo, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Variable capacity turbine. 4,880,351, Cl. 415-164.000.
Inoue, Masatsugu; Tokita, Kiyoshi; Sone, Toshinao; Fujiwara, Takeshi; and Nakane, Kazunori, to Kabushiki Kaisha Toshiba. Color cathode ray tube. 4,881,004, Cl. 313-408.000.
Inoue, Nanao: *See*—
Saito, Koichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,881,089, Cl. 346-140.00R.
Inoue, Noriyuki; and Heki, Tatsuo, to Fuji Photo Film Co., Ltd. Direct positive photographic material. 4,880,727, Cl. 430-378.000.
Inoue, Noriyuki: *See*—
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Inoue, Yuichi: *See*—
Horiuchi, Tetsuo; and Inoue, Yuichi, 4,880,416, Cl. 604-307.000.
Insitut Francais du Petrole: *See*—
Dubesset, Michel; and Cliet, Christian, 4,881,207, Cl. 367-31.000.
Insta-Foam Products: *See*—
Murray, Pat L.; Braun, Robert; and McNamara, Dawn, 4,880,143, Cl. 222-135.000.
Institut De Recherches Chimiques et Biologiques Appliquees (I.R.-C.E.B.A.): *See*—
Danree, Bernard; Faulques, Michelle; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, 4,880,807, Cl. 514-252.000.
Institut Dr. Friedrich Forster Pruferatebau GmbH: *See*—
Pfisterer, Helmut; Schutze, Wolfgang; and Wezel, Heinz, 4,881,031, Cl. 324-233.000.

Institut Dr. Friedrich Forster Prufgeratebau GmbH: *See*—
Auslander, Klaus; Fabris, Hans-Jurgen; Patzwaldt, Wolfgang; and Seichter, Helmut, 4,881,036, Cl. 324-329.000.
Institut Textile de France: *See*—
Chanzy, Henri D.; and Paillet, Michel, 4,880,469, Cl. 106-203.000.
Intel Corporation: *See*—
Sprague, David L.; Harney, Kevin; Simon, Allen H.; and Taylor, Herbert H., Jr., 4,881,194, Cl. 364-900.000.
Intelmatec Corporation: *See*—
Akagawa, Minoru; Naoi, Satoshi; and Fukumoto, Heijiro, 4,880,518, Cl. 204-298.000.
Interdibipack S.p.A.: *See*—
Di Bernardo, Pietro, 4,879,863, Cl. 53-557.000.
Intermedics, Inc.: *See*—
Baker, Ross G., Jr.; Calfee, Richard V.; Haluska, Edward A.; and Whistler, Stephen J., 4,880,004, Cl. 128-419.0PG.
Pless, Benjamin D.; and Sweeney, Michael B., 4,880,005, Cl. 128-419.0PG.
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Ashley, Jonathan J.; Call, Mark G.; and Siegel, Paul H., 4,881,076, Cl. 341-95.000.
Baum, Thomas H.; Comita, Paul B.; and Jackson, Robert L., 4,880,959, Cl. 219-121.850.
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.
Clark, Mark E.; Greever, Richard G.; Schmier, Larry J.; and Wong, Jerome D., 4,881,230, Cl. 371-20.100.
Correale, Anthony, 4,880,754, Cl. 437-51.000.
Davari, Bijan; Hwang, Wei; and Lu, Nicky C., 4,881,105, Cl. 357-23.400.
Hailpern, Brent T.; Hoevel, Lee W.; and Shapiro, Eugene, 4,881,164, Cl. 364-200.000.
Moreau, Wayne M.; and Chiong, Kaolin N., 4,880,722, Cl. 430-192.000.
Vincent, James P., 4,881,179, Cl. 364-518.000.
International Consumer Brands, Inc.: *See*—
Levine, Morris M., 4,880,713, Cl. 429-100.000.
International Flavors & Fragrances: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,880,625, Cl. 424-84.000.
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Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Sands, Keith P., 4,880,640, Cl. 426-3.000.
International Fuel Cells Corporation: *See*—
Luczak, Francis J.; and Landsman, Douglas A., 4,880,711, Cl. 429-40.000.
International Mobile Machines Corporation: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.
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Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,880,701, Cl. 428-34.200.
International Shoe Machine Corporation: *See*—
Becka, Michael M.; and Walega, William, 4,879,778, Cl. 12-146.00D.
Inui, Tetsuya: *See*—
Deguchi, Toshihisa; Fujii, Yoshikazu; Inui, Tetsuya; Ohta, Kenji; and Katoh, Schohichi, 4,881,216, Cl. 369-54.000.
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Wen, Sayling, 4,881,260, Cl. 379-76.000.
Inventing S.A.: *See*—
Ericksson, Tore, 4,880,672, Cl. 427-356.000.
Iolab Corporation: *See*—
Holmes, Martin J.; and Harris, Ron, 4,880,000, Cl. 128-303.00R.
Irikura, Koji, to Kanzaki Kokyukoki Mfg. Co., Ltd. Transmission assembly for self-propelled working vehicles. 4,880,070, Cl. 180-53.100.
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Watanabe, Osamu; Komatsu, Kosuke; Ishibashi, Masaichi; Kimura, Mutsumi; Koyama, Shinsuke; Fujimori, Takahiro; Fujiwara, Tadashi; and Kuroiwa, Junko, 4,881,067, Cl. 340-750.000.
Ishida, Hiroyuki: *See*—
Ogihara, Masuo; Ishida, Hiroyuki; Nagaoka, Shinji; Seki, Youichi; Tagami, Shigeru; Yamazaki, Hiroshi; and Shinozaki, Nobuo, 4,881,096, Cl. 354-400.000.
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Hasegawa, Hiromi; and Ishiguro, Toshiaki, 4,880,091, Cl. 192-3.300.
Ishiguro, Yasuaki, to Nikon Corporation. Apparatus for controlling automatic focusing in cameras. 4,881,097, Cl. 354-402.000.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Sakamoto, Masashi; Okuda, Haruo; Takahashi, Hideo; and Yamada, Eiji, 4,880,703, Cl. 428-378.000.
Ishii, Hakumi: *See*—
Hida, Tsuneo; Takizawa, Sumio; Ishii, Hakumi; Kegasa, Hideo; and Izawa, Minoru, 4,881,020, Cl. 318-626.000.
Ishii, Kazuo: *See*—
Kato, Eiichi; and Ishii, Kazuo, 4,880,716, Cl. 430-49.000.
Ishii, Koji, to Ryobi Ltd. Image position adjusting apparatus of rotary press machine. 4,879,950, Cl. 101-217.000.
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Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.
Ishikawa, Reimei: *See*—
Yamahira, Yoshiya; Okuzawa, Yoshiko; Fujioka, Keiji; Sato, Shigeji; and Ishikawa, Reimei, 4,880,796, Cl. 514-206.000.
Ishikawa, Shunichi, to Fuji Photo Film Co., Ltd. Light-sensitive dual-walled microcapsule containing polymerizable compound and silver halide, and light-sensitive material employing the same. 4,880,721, Cl. 430-138.000.
Ishikawa, Takatoshi; and Nakajima, Junya, to Fuji Photo Film Co., Ltd. Processing method for silver halide color photosensitive materials utilizing the overflow from the color developer. 4,880,728, Cl. 430-380.000.
Ishizuka, Shigeo: *See*—
Kuzuno, Katsutoshi; Watanabe, Hiroshi; and Ishizuka, Shigeo, 4,880,943, Cl. 174-72.00A.
Ishizuka, Shinichi: *See*—
Ichimura, Yoshiaki; Ishizuka, Shinichi; Komoto, Mitsuo; and Umesato, Shoji, 4,880,399, Cl. 439-689.000.
Isoguchi, Seiichi; Murai, Yoshio; Takayama, Jun; and Nagaishi, Katsuya, to Konica Corporation. Still video camera with electronic shutter and flash. 4,881,127, Cl. 358-213.190.
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Capizzi, Amedeo; Arsura, Emilio; and Spinelli, Pia, 4,879,837, Cl. 43-124.000.
Itakura, Tomiya; and Kamifuji, Hiroshi, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Method of and apparatus for controlling engine revolution speed. 4,879,982, Cl. 123-339.000.
Ito, Masayoshi: *See*—
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Sugihara, Hirosada; Itoh, Katsumi; and Nishikawa, Kohei, 4,880,809, Cl. 514-255.000.
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ITT SWF Auto-Electric GmbH: *See*—
Egner-Walter, Bruno; Schmid, Eckhardt; and Scholl, Wolfgang, 4,879,783, Cl. 15-250.210.
Iwai, Hiroshi: *See*—
Tsujimoto, Jun-ichi; Matsui, Masataka; Iwai, Hiroshi; and Ohtani, Takayuki, 4,881,202, Cl. 365-200.000.
Iwamoto, Keiichi: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; Torichigai, Masaaki; and Koizumi, Kiyoshi, 4,879,973, Cl. 122-379.000.
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Iwasaki, Yasuhiro: *See*—
Kuwabara, Youhei; Asaoka, Teruo; and Iwasaki, Yasuhiro, 4,880,516, Cl. 204-224.00M.
Iwata, Mitsuo: *See*—
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IXYS Corporation: *See*—
Barron, Mark B., 4,881,106, Cl. 357-23.800.
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Suckow, William H., 4,879,912, Cl. 73-861.610.
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Meinecke, Albrecht; and Musselmann, Walter, 4,880,532, Cl. 209-268.000.
Schiel, Christian, 4,880,501, Cl. 162-358.000.
Sollinger, Hans-Peter; Meinecke, Albrecht; Weiss, Hans; and Beiswanger, Rudolf, 4,880,671, Cl. 427-356.000.

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Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.

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Baum, Thomas H.; Comita, Paul B.; and Jackson, Robert L., 4,880,959, Cl. 219-121.850.

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Jacobson, Jeff A. Blind cleaning device. 4,879,782, Cl. 15-210.00A.

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Baubles, Richard C., 4,880,400, Cl. 439-722.000.

Jacquel, Dominique, to Somfy. Control device for a sunshade blind responsive to meteorological phenomenon. 4,881,219, Cl. 364-400.000.

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Gauthier, Christian, 4,880,945, Cl. 200-61.540.

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Jain, Kantilal. Frequency-stabilized line-narrowed excimer laser source system for high resolution lithography. 4,881,231, Cl. 372-32.000.

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Langa, John M.; Boswell, Michael J.; and Littleton, Kermit R., 4,880,167, Cl. 239-542.000.

James River II, Inc.: *See*—
Yanidis, Apostol, 4,880,696, Cl. 428-349.000.

Jancso , Sandor: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.

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Japan Crown Cork Co., Ltd.: *See*—
Doi, Kouichi, 4,880,127, Cl. 215-252.000.

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Matsushita, Hajime; Shibagaki, Makoto; and Takahashi, Kyoko, 4,880,937, Cl. 546-344.000.

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Jelsma, Henk H., to Baroid Technology, Inc. Apparatus for drilling a curved borehole. 4,880,067, Cl. 175-107.000.

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Spinelli, Louis A.; and Jenniges, Jeffrey M., 4,880,371, Cl. 425-135.000.

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Tomita, Ken; and Mori, Seiichiro, 4,880,977, Cl. 205-311.000.

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Van Horn, John W.; and Johnson, Clyde, 4,880,406, Cl. 464-38.000.

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Johnson, Janice A.: *See*—
Johnson, Robert P.; and Johnson, Janice A., 4,879,882, Cl. 63-4.000.

Johnson & Johnson Consumer Products, Inc.: *See*—
Desimone, Joseph A., 4,879,781, Cl. 15-110.000.

Johnson, Karle J.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.

Johnson, Philip D.: *See*—
Hayes, William J.; Matrone, Harry A.; and Johnson, Philip D., 4,880,477, Cl. 148-141.000.

Johnson, Robert P.; and Johnson, Janice A., to RPJ Development Corporation. Jewelry with interchangeable elements. 4,879,882, Cl. 63-4.000.

Johnson, Walter A.: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,880,170, Cl. 241-5.000.

Johnston, Joseph G., to Bicron Corporation. Low level radiation measurement device. 4,880,981, Cl. 250-369.000.

Johnston, Lonnie E.; and Volcansek, Steven J., to Crawford Fitting Company. Gauge for coupling component. 4,879,819, Cl. 33-833.000.

Johnston, Robert: *See*—
Scholefield, John; and Johnston, Robert, 4,880,149, Cl. 222-207.000.

Jonas, Werner; and Findlay, Nathanial B. Rowing machine. 4,880,224, Cl. 272-72.000.

Jones, David; and Abbott, David I., to Tunstall Telecom Limited. Sheltered housing scheme communications system. 4,881,252, Cl. 379-38.000.

Jones, Dennis C.: *See*—
Rockwell, David A.; Mangir, Metin S.; White, Jeffrey O.; and Jones, Dennis C., 4,880,295, Cl. 350-354.000.

Jones, Douglas. Detached collimator apparatus for radiation therapy. 4,880,985, Cl. 250-505.100.

Jones, Gordon R. Optical sensors for measurement of a variable parameter. 4,880,970, Cl. 250-227.000.

Jones, Michael D.: *See*—
Fayerman, Jeffrey T.; Jones, Michael D.; Michel, Karl H.; Yao, Raymond C.; and Zmijewski, Milton J., 4,880,735, Cl. 435-71.000.

Jones, Philip E.; and Highet, Robert, to BPB Industries Public Limited Company. Floor system. 4,879,856, Cl. 52-403.000.

Jones, Robert J.; and Chang, Glenn E. C., to TRW, Inc. Fiber reinforced thermoplastic resin matrix composites. 4,880,584, Cl. 264-135.000.

Jordan, Russell T., to Chemex Pharmaceuticals, Inc. Compositions of catecholic butanes with zinc. 4,880,637, Cl. 424-641.000.

Jorgensen, Robert W., to Hubbell Incorporated. Fixture box for ceiling fan support. 4,880,128, Cl. 220-3.900.

Joschko, Gunter: *See*—
Redlich, Horst; and Joschko, Gunter, 4,881,133, Cl. 358-299.000.

Josephson, Donald G., to Polaroid Corporation. Data card illumination arrangement. 4,881,091, Cl. 354-132.000.

Jost, Frantisek; and Wisotzki, Klaus-Dieter, to Henkel Kommanditgesellschaft auf Aktien. Liquid cleaning preparation for hard surfaces. 4,880,558, Cl. 252-174.230.

Joukou, Isao; Sekikawa, Ayako; Sugi, Hideo; and Tahara, Kenji, to Kurita Water Industries, Ltd. Sustained release aromatic. 4,880,774, Cl. 512-2.000.

Jousson, Pierre J.: *See*—
Moret, Michel A.; and Jousson, Pierre J., 4,880,382, Cl. 433-118.000.

Judge, John L., to Magni Systems, Inc. Color video signal phase detector. 4,881,121, Cl. 358-10.000.

Judkins, Ren, to BW-USA, Inc. Spacer devices. 4,880,044, Cl. 160-84.100.

Juillerat, Denis, to Meseltron S.A. Contact sensor for calipering pieces such as workpieces. 4,879,916, Cl. 73-865.800.

Jumel, Bernard; and Pileur, Charles, to Yves Saint Laurent Parfumes. Casing with invisible hinge. 4,880,139, Cl. 220-337.000.

Jung, Werner; Klesse, Christoph; and Sievers, Axel. Hydroxylic acrylate copolymer process for its preparation, and coating agent based on the acrylate. 4,880,889, Cl. 526-323.000.

Jurgensen, Holger: *See*—
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 4,880,492, Cl. 156-610.000.

Juslin, Lee: *See*—
Juslin, Scott E.; and Juslin, Lee, 4,879,928, Cl. 81-488.000.

Juslin, Scott E.; and Juslin, Lee. Balloon stretcher. 4,879,928, Cl. 81-488.000.

Jyoraku, Fumio: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.

Kabashima, Kazuo: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,880,767, Cl. 503-217.000.

Kabelmetal Electro GmbH: *See*—
Obermeier, Manfred; and Herrmann, Erhard, 4,880,484, Cl. 156-51.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kokubo, Ichiro; Kourida, Kazuhiko; Hashimoto, Shunichi; Mimura, Kazuhiro; and Shibata, Zenichi, 4,880,480, Cl. 148-320.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kato, Takeo; Kobayashi, Shingo; Takagi, Kazuo; Watanabe, Masahiro; and Kaneko, Kiyoshi, 4,881,173, Cl. 364-431.070.

Kabushiki Kaisha Nippon Coinco: *See*—
Kobayashi, Osamu; Hayashi, Hiroshi; and Yamagishi, Ryoji, 4,880,096, Cl. 194-206.000.

Kabushiki Kaisha Patine Shokai: *See*—
Ohashi, Kazuo, 4,880,051, Cl. 165-45.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Kito, Shozo; Harada, Shoichi; Imai, Hajime; Ohta, Hisatoshi; Suzuki, Masamitsu; and Muramatsu, Tadao, 4,880.092, Cl. 192-4.00A.
Nishimura, Yuji, 4,880,253, Cl. 280-804.000.

Kabushiki Kaisha Toshiba: *See*—
Eguchi, Toyokazu, 4,881,272, Cl. 455-143.000.
Inoue, Masatsugu; Tokita, Kiyoshi; Sone, Toshinao; Fujiwara, Takeshi; and Nakane, Kazunori, 4,881,004, Cl. 313-408.000.
Ito, Takeo; Takeuchi, Hajime; Hashimoto, Minoru; Fukaya, Toshio; and Koishi, Masumi, 4,880,666, Cl. 427-128.000.
Kameda, Kazuyoshi; Kaji, Koichi; Yahiro, Hiroshi; and Kobayashi, Kenichiro, 4,881,069, Cl. 340-735.000.
Kawamura, Masahiko, 4,881,029, Cl. 324-158.00R.
Kubo, Hiroshi; and Yoshida, Atsuya, 4,880,965, Cl. 250-213.0VT.
Momodomi, Masaki; Ogura, Mitsugi; and Kumanomido, Takaki, 4,881,113, Cl. 357-51.000.
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,881,120, Cl. 357-23.400.
Nambu, Kyojiro; and Rifu, Toshihiro, 4,881,251, Cl. 378-7.000.
Nitta, Tsuneo; Uehara, Kensuke; and Watanabe, Sadakazu, 4,881,266, Cl. 381-43.000.
Okochi, Sadao, 4,881,014, Cl. 315-246.000.
Sukai, Emiko, 4,880,214, Cl. 267-136.000.
Tsujimoto, Jun-ichi; Matsui, Masataka; Iwai, Hiroshi; and Ohtani, Takayuki, 4,881,202, Cl. 365-200.000.
Yoshikawa, Kuniyoshi, 4,881,108, Cl. 357-23.500.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Ikeda, Hayato; Ohta, Kazuhiro; and Kawamura, Hisato, 4,880,361, Cl. 417-269.000.
Suzuki, Shinichi; Hibino, Soukichi; Hamaoka, Takahiro; and Ohta, Masaki, 4,880,356, Cl. 417-53.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; and Niimi, Hiroshi, 4,879,873, Cl. 57-413.000.

Kabushiki Kaishia Toshiba: *See*—
Shimoma, Taketoshi; Morohashi, Katsuei; and Shimokobe, Jiro, 4,881,015, Cl. 315-371.000.

Kabushikigaisha Tokyo Kikai Seisakusho: *See*—
Yoshida, Kouichi; and Harada, Noritake, 4,879,951, Cl. 101-363.000.

Kadono, Takashi, to Minolta Camera Kabushiki Kaisha. Memory device. 4,881,206, Cl. 365-227.000.

Kageyama, Hitoshi; Suzuki, Toshikazu; Sakamoto, Keijiro; Kyogoku, Tetsuo; and Nino, Masayuki, to Minolta Camera Kabushiki Kaisha. Transmission viewing screen of image projector apparatus. 4,880,292, Cl. 350-128.000.

Kagi, Rudolf; and Baumgartner, Eugen, to Maschinenfabrik Ad. Schulthess & Co. AG. Continuous flow washing machine. 4,879,887, Cl. 68-16.000.

Kahan, Frederick M.: *See*—
Kropp, Helmut; and Kahan, Frederick M., 4,880,793, Cl. 514-192.000.

Kahkipuro, Matti; Makinen, Heimo; and Perttula, Jouko, to Kone Elevator GbmH. Method for determining the position of an elevator car and a pulse count based floor selector. 4,880,082, Cl. 187-134.000.

Kaiser, Herbert J., to Calgon Corporation. Method for detackification of paint spray operation wastes. 4,880,471, Cl. 106-286.600.

Kaiserfeld, Hans: *See*—
Jerlich, Werner J.; Kugler, Alfred; Kaiserfeld, Hans; Schulhofer, Anton; and Zechner, Werner, 4,880,481, Cl. 148-325.000.

Kaiwa, Ryoichi; Kudo, Michiyoshi; Kobayashi, Keiki; Suganuma, Yuichiro; and Adachi, Naotomo, to Matsushita Electric Industrial Co., Ltd. Portable type mobile radio telephone. 4,881,258, Cl. 379-58.000.

Kaji, Koichi: *See*—
Kameda, Kazuyoshi; Kaji, Koichi; Yahiro, Hiroshi; and Kobayashi, Kenichiro, 4,881,069, Cl. 340-735.000.

Kajihara, Junichi; Kiyota, Takao; and Hayashi, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for purifying a physiologically active substance produced by recombinant DNA technique. 4,880,915, Cl. 530-413.000.

Kajimura, Takashi: *See*—
Chinone, Naoki; Uomi, Kazuhisa; Fukuzawa, Tadashi; Matsueda, Hideaki; Kajimura, Takashi; and Ohtoshi, Tsukuru, 4,881,235, Cl. 372-45.000.
Chinone, Naoki; Uomi, Kazuhisa; Fukuzawa, Tadashi; Matsueda, Hideaki; and Kajimura, Takashi, 4,881,238, Cl. 372-68.000.

Kakuma, Yojiro: *See*—
Koyari, Yukio; Sogame, Eiji; Kishimoto, Kanji; and Kakuma, Yojiro, 4,879,874, Cl. 60-259.000.

Kakuta, Rokuroh, legal representative: *See*—
Kato, Masahiro; and Kakuta, Yuichi, deceased, 4,881,142, Cl. 360-106.000.

Kakuta, Yuichi, deceased: *See*—
Kato, Masahiro; and Kakuta, Yuichi, deceased, 4,881,142, Cl. 360-106.000.

Kalamazoo Banner Works, Inc.: *See*—
Lepley, Roger M., 4,880,195, Cl. 248-219.400.

Kallenbach, Neville R.: *See*—
Cornelius, Paul A.; Hochstrasser, Robin M.; Kallenbach, Neville R.; Rubin, Harvey; and Todaro, George J., 4,880,512, Cl. 204-157.610.

Kalloy, Katalin: *See*—
Knoll, Jozsef; Birkmayer, Walter; Kalloy, Katalin; Marton, Jeno; and Ecsery, Zoltan, 4,880,833, Cl. 514-565.000.

Kaltbeitzel, Gunter; Klein, Michael; Renner, Martin; and Wolk, Joachim, to Alcatel, N.V. Test circuit arrangement for a communication network and test method using same. 4,881,229, Cl. 371-20.400.

Kameda, Kazuyoshi; Kaji, Koichi; Yahiro, Hiroshi; and Kobayashi, Kenichiro, to Kabushiki Kaisha Toshiba. Font compression method and apparatus. 4,881,069, Cl. 340-735.000.

Kamifuji, Hiroshi: *See*—
Itakura, Tomiya; and Kamifuji, Hiroshi, 4,879,982, Cl. 123-339.000.

Kaminski, Ronald S., to Owens-Illinois Plastic Products Inc. Apparatus for applying labels to blow molded articles. 4,880,369, Cl. 425-116.000.

Kamiyama, Masayuki: *See*—
Aoki, Masaaki; Tani, Mayumi; Kamiyama, Masayuki; and Asai, Kiyotsugu, 4,880,869, Cl. 524-773.000.

Kampe, Wolfgang: *See*—
Bohm, Erwin; Holck, Jens-Peter; Kampe, Wolfgang; Leinert, Herbert; Muller-Beckmann, Bernd; and Strein, Klaus, 4,880,805, Cl. 514-237.500.

Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, to Canon Kabushiki Kaisha. Image recording method using fluid ink electrochemically imparted with adhesiveness. 4,881,084, Cl. 346-1.100.

Kanai, Hiroshi: *See*—
Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, 4,880,890, Cl. 528-45.000.
Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, 4,880,891, Cl. 528-45.000.

Kanaljuk, Viktor L.; Surakov, Anatoly M.; Chornogotsky, Vasily M.; and Shifrin, Lazar N., to Nauchno-Issledovatelsky, Proektno-Konstruktorsky I Tekhnologichesky Institut Transformatorostroeniya. Bar for induction devices. 4,880,944, Cl. 174-138.00E.

Kanamori, Hiroo; Tanaka, Gotaro; Kyoto, Michihisa; Yoshioka, Naoki; and Mizutani, Futoshi, to Sumitomo Electric Industries, Ltd. Method for producing glass preform for optical fiber containing fluorine in cladding. 4,880,452, Cl. 65-3.120.

Kanda, Masahiro: *See*—
Mochizuki, Shigehiko; Kanda, Masahiro; and Serizawa, Yoshinori, 4,880,389, Cl. 439-125.000.

Kanda, Yutaka: *See*—
Kasai, Masaji; Kanda, Yutaka; Kono, Motomichi; Saito, Yutaka; Morimoto, Makoto; and Ashizawa, Tadashi, 4,880,825, Cl. 514-409.000.

Kandatsu, Kiyoshi; Yamazaki, Makoto; and Kinota, Hiroshi, to Fuji Electric Co., Ltd. Contactor device for circuit breaker. 4,880,948, Cl. 200-151.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Matsumura, Shoichi; Nanbu, Toshiro; and Furukawa, Hisao, 4,880,861, Cl. 524-314.000.

Kaneko, Katsuhiro: *See*—
Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, 4,880,694, Cl. 428-336.000.

Kaneko, Kiyoshi: *See*—
Kato, Takeo; Kobayashi, Shingo; Takagi, Kazuo; Watanabe, Masahiro; and Kaneko, Kiyoshi, 4,881,173, Cl. 364-431.070.

Kaneko, Shuzo: *See*—
Sato, Hiroshi; Tanaka, Kazumi; Kushida, Naoki; Katayama, Masato; Tamura, Yasuyuki; Hasegawa, Tetsuo; Yaegashi, Hisao; Kaneko, Shuzo; Tohma, Koichi; and Suzuki, Takayuki, 4,880,324, Cl. 400-241.000.

Kaneko, Tomihiro: *See*—
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihiro, 4,880,277, Cl. 297-467.000.

Kaneko, Yutaka, to Konica Corporation. Light-sensitive silver halide photographic material. 4,880,733, Cl. 430-551.000.

Kanno, Hideo; Yamashita, Shinichi; Omata, Satoshi; Enari, Masahiko; Kuno, Mitsutoshi; and Osada, Yoshiyuki, to Canon Kabushiki Kaisha. Active matrix-type display panel. 4,881,066, Cl. 340-719.000.

Kanno, Masahide: *See*—
Nishigaki, Shinichi; Nakamura, Takeaki; Yoshinaga, Jun; Kanno, Masahide; Yabe, Hisao; Yokoi, Takeshi; Oozeki, Kazuhiko; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,879,992, Cl. 128-6.000.

Kanojia, Ramesh M.; Lever, O. William, Jr.; and Press, Jeffery B., to Ortho Pharmaceutical Corporation. O-functionalized derivatives of substituted isoquinolin-3-ols having cardiotonic and/or phosphodiesterase fraction III inhibiting properties and/or renal vasodilating properties. 4,880,817, Cl. 514-309.000.

Kansai Electric Power Co., Inc., The: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; Torichigai, Masaaki; and Koizumi, Kiyoshi, 4,879,973, Cl. 122-379.000.

Kansai Special USA Corp.: *See*—
Prais, Eugene R., 4,879,960, Cl. 112-291.000.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Irikura, Koji, 4,880,070, Cl. 180-53.100.

Kao, Che-l: *See*—
Ho, Thoi; and Kao, Che-l, 4,880,897, Cl. 528-199.000.

Kaplan, Sam: *See*—
Adler, Robert; Fogelson, Mark; and Kaplan, Sam, 4,880,665, Cl. 427-126.300.

Kapp-Schwoerer, Diethard: *See*—
Denz, Martin; and Kapp-Schwoerer, Diethard, 4,879,968, Cl. 118-300.000.

Karalevicz, John M.: *See*—
Milliser, Charles E.; Karalevicz, John M.; and Quick, Harry C., 4,880,323, Cl. 400-196.100.

Karger, Paul: *See*—
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,881,263, Cl. 380-21.000.

Karol, Thomas J., to R. T. Vanderbilt Company, Inc. Fuel compositions containing maleic derivatives of 2,5-dimercapto-1,3,4-thiadiazole. 4,880,437, Cl. 44-57.000.

Karsner, Grant C.: *See*—
Altman, Lawrence J.; Choi, Byung C.; and Karsner, Grant C., 4,880,748, Cl. 436-60.000.

Kasai, Masaji; Kanda, Yutaka; Kono, Motomichi; Saito, Yutaka; Morimoto, Makoto; and Ashizawa, Tadashi, to Kyowa Hakko Kogyo Kabushiki Kaisha. Mitomycin derivatives. 4,880,825, Cl. 514-409.000.

Kasai, Minoru; and Nakamura, Minoru, to Hitec Co., Ltd. Method and apparatus for delivering sausages to a bar. 4,880,105, Cl. 198-465.400.

Kashihara, Yuji: *See*—
Taga, Yutaka; and Kashihara, Yuji, 4,879,925, Cl. 74-867.000.

Kashio, Jiro: *See*—
Sasaki, Hisao; Terada, Matsuaki; Matsui, Susumu; Kawakita, Kenji; Kashio, Jiro; Baba, Shiro; Akao, Yasushi; and Okochi, Toshio, 4,881,167, Cl. 364-200.000.

Kaskey, Jeffrey A.: *See*—
Priatko, Gordon J.; and Kaskey, Jeffrey A., 4,881,190, Cl. 364-718.000.

Kaspar, Klaus P., to Boehringer Mannheim GmbH Process and reagent for the determination of a reaction partner of an immunological reaction. 4,880,731, Cl. 435-7.000.

Katagiri, Kazuharu: *See*—
Yoshinaga, Kazuo; Katagiri, Kazuharu; and Shinjo, Kenji, 4,880,560, Cl. 252-299.010.

Kataoka, Hiroyuki; and Kumakura, Tosiyuki, to Canon Kabushiki Kaisha. Flash photographic apparatus. 4,881,013, Cl. 315-241.00P.

Katayama Kogyo Co., Ltd.: *See*—
Shimizu, Shoji, 4,880,674, Cl. 428-31.000.

Katayama, Masato: *See*—
Sato, Hiroshi; Tanaka, Kazumi; Kushida, Naoki; Katayama, Masato; Tamura, Yasuyuki; Hasegawa, Tetsuo; Yaegashi, Hisao; Kaneko, Shuzo; Tohma, Koichi; and Suzuki, Takayuki, 4,880,324, Cl. 400-241.000.

Katayama, Motohiro; and Suzuki, Tatsuya, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mounting structure. 4,880,215, Cl. 267-140.100.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic lithographic printing plate precursor having resin outer layer. 4,880,716, Cl. 430-49.000.

Kato, Kazuo; Murakami, Kimihiro; Mochizuki, Hidenori; and Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Cephalosporin derivatives. 4,880,798, Cl. 514-206.000.

Kato, Masahiro; and Kakuta, Yuichi, deceased (by Kakuta, Rokuroh, legal representative), to Canon Denshi Kabushiki Kaisha. Magnetic disc unit employing temperature compensation. 4,881,142, Cl. 360-106.000.

Kato, Takahito: *See*—
Kyushima, Hiroyuki; Nakamura, Kimitsugu; and Kato, Takahito, 4,881,008, Cl. 313-532.000.

Kato, Takeo; Kobayashi, Shingo; Takagi, Kazuo; Watanabe, Masahiro; and Kaneko, Kiyoshi, to Kabushiki Kaisha Komatsu Seisakusho. Electronically controlled automatic speed changing apparatus. 4,881,173, Cl. 364-431.070.

Kato, Yoji; Minai, Osamu; Tukamoto, Hirosi; Hagiwara, Takashi; and Kosaka, Katsuji, to Nippondenso Co., Ltd. Manually assistable electric driving device. 4,881,018, Cl. 318-9.000.

Katoh, Schohichi: *See*—
Deguchi, Toshihisa; Fujii, Yoshikazu; Inui, Tetsuya; Ohta, Kenji; and Katoh, Schohichi, 4,881,216, Cl. 369-54.000.

Katsuki, Hisaaki: *See*—
Sakamoto, Shunji; Okamizu, Shigeo; Ota, Yuji; and Katsuki, Hisaaki, 4,880,072, Cl. 180-140.000.

Katz, Ira: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,880,625, Cl. 424-84.000.

Katz, Jeffrey: *See*—
Leiman, Basil C.; Butler, Bruce D.; Katz, Jeffrey; and Salzarulo, Henry H., 4,879,999, Cl. 128-207.140.

Kaufman, Leon; Arakawa, Mitsuaki; McCarten, Barry M.; Fehn, John H.; and Krasnor, Stephen, to University of California, The Regents of the. Switchable MRI RF coil array with individual coils having different and overlapping fields of view. 4,881,034, Cl. 324-318.000.

Kaukeinen, Joseph Y.; and Tyo, Eileen M., to Eastman Kodak Company. Method of making a fiber optic array. 4,880,494, Cl. 156-633.000.

Kawabata, Susumu; Inoue, Tetsuzo; and Niimi, Hiroshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Spinning unit in open-end spinning machine. 4,879,873, Cl. 57-413.000.

Kawada, Noriyuki: *See*—
Suzuki, Tsutomu; Seko, Tatsushi; Tobita, Kuniharu; Matsubayashi, Saburo; Kougo, Nobuhiko; Ogawa, Kiyoshi; Taniguchi, Susumu; Minami, Masaharu; Hayakawa, Masayuki; and Kawada, Noriyuki, 4,879,788, Cl. 26-94.000.

Kawada, Shinichi: *See*—
Hojo, Takeshi; Yamamoto, Kanshi; Kawada, Shinichi; Murabayashi, Kazushige; Akimoto, Mamoru; and Fukano, Michio, 4,879,918, Cl. 74-5.470.

Kawaguchi, Hiroshi: *See*—
Shibahara, Akihiro; Taguchi, Takehiko; Uehara, Akira; Shinohara, Koji; and Kawaguchi, Hiroshi, 4,880,318, Cl. 384-125.000.

Kawaguchi, Masashi: *See*—
Endo, Yoshihiro; Kawaguchi, Masashi; Kishishita, Hiroshi; and Uede, Hisashi, 4,880,661, Cl. 427-38.000.

Kawahara, Sei: *See*—
Hamamura, Ken; Kawahara, Sei; and Goto, Mitsuhiro, 4,880,374, Cl. 425-185.000.

Kawakami, Kenji: *See*—
Meguro, Hiroshi; Yamamoto, Yoshinori; Ohyama, Masao; Horikawa, Kenichi; Mizusawa, Shigeru; and Kawakami, Kenji, 4,881,137, Cl. 360-96.500.

Kawakami, Moriatsu: *See*—
Uchida, Shinya; Kohzu, Kazuya; Fujii, Kiyoshi; and Kawakami, Moriatsu, 4,881,268, Cl. 382-7.000.

Kawakita, Kenji: *See*—
Sasaki, Hisao; Terada, Matsuaki; Matsui, Susumu; Kawakita, Kenji; Kashio, Jiro; Baba, Shiro; Akao, Yasushi; and Okochi, Toshio, 4,881,167, Cl. 364-200.000.

Kawamoto, Hiroyuki: *See*—
Ishida, Yasumasa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.

Kawamura, Hisato: *See*—
Ikeda, Hayato; Ohta, Kazuhiro; and Kawamura, Hisato, 4,880,361, Cl. 417-269.000.

Kawamura, Kiyoshi: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,880,857, Cl. 523-205.000.

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Paraskevas, Elefterios, 4,879,892, Cl. 72-290.000.
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Okamura, Katsutoshi; Esaki, Yasuo; Matsuzawa, Koichi; and Asano, Katsuhiko, 4,880,650, Cl. 426-330.400.
Kiriyama, Masaru: *See*—
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Koch, Dietmar: *See—*
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Kolpe, Vasant V.: *See—*
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Kaneko, Yutaka, 4,880,733, Cl. 430-551.000.
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Konijn, Gerrit, to Shell Oil Company. Gas/liquid contacting apparatus. 4,880,451, Cl. 55-237.000.

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Kononov, Anthony. Filter analyzing system. 4,881,176, Cl. 364-500.000.

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Korn, Yoram: *See—*
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Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,880,386, Cl. 439-68.000.

Korte, Heinrich. Package. 4,880,114, Cl. 206-418.000.

Kos, Robert D., to Fluoroware, Inc. Robotic accessible wafer shipper assembly. 4,880,116, Cl. 206-454.000.

Kosaka, Katsuji: *See—*
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Kostusyk, Joseph L.; and Rizvi, Syed Q. A., to Lubrizol Corporation, The. Methylene linked aromatic pour point depressant. 4,880,553, Cl. 252-58.000.

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Kougo, Nobuhiko: *See—*
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Kovacevic, Nebojsa D.: *See—*
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Yamauchi, Yukiji; Tsukamoto, Nobuo; and Koya, Masahiro, 4,881,271, Cl. 455-56.000.

Koyama, Hiroshi: *See—*
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,880,975, Cl. 250-306.000.

Koyama, Kazuo; and Amano, Yoshikai, to Clarion Co., Ltd. RDS system radio. 4,881,273, Cl. 455-161.000.

Koyama, Shinsuke: *See—*
Watanabe, Osamu; Komatsu, Kosuke; Ishibashi, Masaichi; Kimura, Mutsumi; Koyama, Shinsuke; Fujimori, Takahiro; Fujiwara, Tadashi; and Kuroiwa, Junko, 4,881,067, Cl. 340-750.000.

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Koyemann Werkzeuge GmbH: *See—*
Doge, Ulrich, 4,880,339, Cl. 408-161.000.

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Evans, Neil L.; Tombolato, Aldo L.; Reynolds, Robert R.; and Meisner, Robert J., 4,880,104, Cl. 198-445.000.

Krantz, Peter. Skiing simulator. 4,880,226, Cl. 272-97.000.

Krasnor, Stephen: *See—*
Kaufman, Leon; Arakawa, Mitsuaki; McCarten, Barry M.; Fehn, John H.; and Krasnor, Stephen, 4,881,034, Cl. 324-318.000.

Krause, Edward A., to General Instrument Corporation. Progressive scan display of video derived from film. 4,881,125, Cl. 358-141.000.

Krauss-Maffei A.G.: *See—*
Fichlseder, Martin; and Preuss, Ingo, 4,880,587, Cl. 264-154.000.

Kremer, Carl P., Jr.: *See—*
Burnett, Thomas W.; Clary, Thomas R.; Iannuzzelli, Vincent F.; and Kremer, Carl P., Jr., 4,880,989, Cl. 250-506.100.

Kremer, Ingo: *See—*
Dorn, Karsten; Grosch, Peter; and Kremer, Ingo, 4,880,669, Cl. 427-210.000.

Krempl, Peter W.: *See—*
Engel, Gunter; Krempl, Peter W.; List, Helmut; Posch, Uwe; and Nitsch, Alfred, 4,881,003, Cl. 310-311.000.

Krishnan, Sivaram: *See—*
Paul, Winfried G.; Price, Ronald L.; and Krishnan, Sivaram, 4,880,864, Cl. 524-404.000.

Kroener, Michael: *See—*
Pfohl, Sigberg; Kroener, Michael; Hartmann, Heinrich; and Denzinger, Walter, 4,880,497, Cl. 162-135.000.

Kromrey, Robert V., to United Technologies Corporation. Breather materials for high pressure molding. 4,880,688, Cl. 428-141.000.

Kronseder, Hermann. Receptacle handling machine. 4,880,098, Cl. 198-346.200.

Kropp, Helmut; and Kahan, Frederick M., to Merck & Co., Inc. Combination of thienamycin-type antibiotics with dipeptidase inhibitors. 4,880,793, Cl. 514-192.000.

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Krupp Polysius AG: *See—*
Heinemann, Otto; Baldus, Heinz-Dieter; and Schroder, Norbert, 4,880,172, Cl. 241-101.200.

Kruschik, Klaus: *See—*
Nowak, Gerhard; Kruschik, Klaus; Morbitzer, Hans P.; Theuer, Rudolf; and Winter, Alfred, 4,880,252, Cl. 280-618.000.

Kubata, Milan; Soukup, Jiri; and Trhlik, Jiri, to Flitex. Tube with yarn catch place. 4,880,183, Cl. 242-125.100.

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Asada, Toshiyuki; Kubo, Seitoku; Nakamura, Shinya; Kinoshita, Masafumi; and Kuroda, Takaaki, 4,879,921, Cl. 74-467.000.

Kubota, Kazunori: *See—*
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Kubota, Osamu: *See—*
Inoue, Kazuo; Kubota, Osamu; Yano, Shunji; Tateishi, Fusao; Noda, Etsuo; Yamaguchi, Koji; and Endo, Tsuneo, 4,880,351, Cl. 415-164.000.

Kudo, Michiyoshi: *See—*
Kaiwa, Ryoichi; Kudo, Michiyoshi; Kobayashi, Keiki; Suganuma, Yuichiro; and Adachi, Naotomo, 4,881,258, Cl. 379-58.000.

Kuenast, Christoph: *See—*
Seppelt, Wolfgang; Hofmeister, Peter; and Kuenast, Christoph, 4,880,837, Cl. 514-594.000.

Kugler, Alfred: *See—*
Jerlich, Werner J.; Kugler, Alfred; Kaiserfeld, Hans; Schulhofer, Anton; and Zechner, Werner, 4,880,481, Cl. 148-325.000.

Kuhlemann, Brace W.; Macabasco, Agilio E.; and Salumbides, Renato R., to Miles Laboratories, Inc. Blood bag having label providing enhanced gas transmissibility. 4,880,425, Cl. 604-404.000.

Kuhn, Falk, to Memminger GmbH. Knitting machine having relatively adjustable needle cams and sinker cams. 4,879,885, Cl. 66-54.000.

Kuhn S.A.: *See—*
Neuerburg, M. Horst, 4,879,870, Cl. 56-13.600.

Kulprathipanja, Santi, to UOP. Process for separating arabinose from a mixture of aldoses. 4,880,919, Cl. 536-127.000.

Kumakura, Tosiyuki: *See—*
Katsoka, Hiroyuki; and Kumakura, Tosiyuki, 4,881,013, Cl. 315-241.00P.

Kumanomido, Takaki: *See—*
Momodomi, Masaki; Ogura, Mitsugi; and Kumanomido, Takaki, 4,881,113, Cl. 357-51.000.

Kumar, Amanda H.: *See—*
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.

Kumazawa, Tetsuo; Shimaoka, Makoto; Fukuda, Kazuyuki; and Adachi, Eiichi, to Hitachi, Ltd. Opto-electronic device and method for producing the device. 4,880,290, Cl. 350-96.200.

Kunichika, Kenji: *See—*
Toyama, Tadao; Ohba, Hisao; and Kunichika, Kenji, 4,880,724, Cl. 430-302.000.

Kuno, Mitsutoshi: *See—*
Kanno, Hideo; Yamashita, Shinichi; Omata, Satoshi; Enari, Masahiko; Kuno, Mitsutoshi; and Osada, Yoshiyuki, 4,881,066, Cl. 340-719.000.

Kuno, Sachiko: *See—*
Hayaishi, Osamu; Ueno, Ryuji; and Kuno, Sachiko, 4,880,742, Cl. 435-238.000.

Kunschke, Eldor W.; and Nernberger, Lee. Beach combing apparatus. 4,879,871, Cl. 56-239.000.

Kuramoto, Akio: *See—*
Yamane, Toshinobu; Kuramoto, Akio; Shimizu, Ryuji; and Nakayama, Makoto, 4,881,078, Cl. 342-155.000.

Kurita Water Industries, Ltd.: *See—*
Joukou, Isao; Sekikawa, Ayako; Sugi, Hideo; and Tahara, Kenji, 4,880,774, Cl. 512-2.000.

Kuroda, Takaaki: *See—*
Asada, Toshiyuki; Kubo, Seitoku; Nakamura, Shinya; Kinoshita, Masafumi; and Kuroda, Takaaki, 4,879,921, Cl. 74-467.000.

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Watanabe, Osamu; Komatsu, Kosuke; Ishibashi, Masaichi; Kimura, Mutsumi; Koyama, Shinsuke; Fujimori, Takahiro; Fujiwara, Tadashi; and Kuroiwa, Junko, 4,881,067, Cl. 340-750.000.

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Kusaka, Yosuke: *See—*
Terui, Nobuhiko; Kusaka, Yosuke; Shiokama, Yoshiharu; and Sasagaki, Nobuaki, 4,881,094, Cl. 354-286.000.

Kusano, Yukihiro: *See—*
Yoshikawa, Masato; Kusano, Yukihiro; Naito, Kazuo; Honda, Toshio; and Hata, Tomonobu, 4,880,515, Cl. 204-192.120.

Kushida, Naoki: *See—*
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,881,084, Cl. 346-1.100.
Sato, Hiroshi; Tanaka, Kazumi; Kushida, Naoki; Katayama, Masato; Tamura, Yasuyuki; Hasegawa, Tetsuo; Yaegashi, Hisao; Kareko, Shuzo; Tohma, Koichi; and Suzuki, Takayuki, 4,880,324, Cl. 400-241.000.
Yaegashi, Hisao; Hasegawa, Tetsuo; Kushida, Naoki; Tohma, Koichi; and Suzuki, Takayuki, 4,880,686, Cl. 428-212.000.

Kushino, Mitsuo: *See—*
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,880,857, Cl. 523-205.000.

Kusumoto, Keiji; and Nagata, Kenzo, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having a plurality of feed openings. 4,881,104, Cl. 355-309.000.

Kuwabara, Youhei; Asaoka, Teruo; Yoshioka, Shogo; and Sugiyama, Haruki, to Shizuoka Seiki Co., Ltd. Electrolytic finishing method and apparatus. 4,880,509, Cl. 204-129.200.

Kuwabara, Youhei; Asaoka, Teruo; and Iwasaki, Yasuhiro, to Shizuoka Seiki Co., Ltd. Electro-chemical machine. 4,880,516, Cl. 204-224.00M.

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Kwang-Chien, Fong. Coordinate vector method for optical input device. 4,880,967, Cl. 250-221.000.

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den Daas, Jan W., 4,879,840, Cl. 47-58.000.

Kwon, Sukky: *See—*
Alicock, Harry R.; Austin, Paul E.; and Kwon, Sukky, 4,880,622, Cl. 424-78.000.

Kyodo Milk Industry Co., Ltd.: *See—*
Akiyama, Yoshinobu; Yoshihashi, Sakashi; and Sakauchi, Iwao, 4,880,659, Cl. 426-656.000.

Kyogoku, Tetsuo: *See—*
Kageyama, Hitoshi; Suzuki, Toshikazu; Sakamoto, Keijiro; Kyogoku, Tetsuo; and Nino, Masayuki, 4,880,292, Cl. 350-128.000.

Kyoto, Michihisa: *See*—
Kanamori, Hiroo; Tanaka, Gotaro; Kyoto, Michihisa; Yoshioka, Naoki; and Mizutani, Futoshi, 4,880,452, Cl. 65-3.120.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Kasai, Masaji; Kanda, Yutaka; Kono, Motomichi; Saito, Yutaka; Morimoto, Makoto; and Ashizawa, Tadashi, 4,880,825, Cl. 514-409.000.

Kyushima, Hiroyuki; Nakamura, Kimitsugu; and Kato, Takahito, to Hamamatsu Photonics Kabushiki Kaisha; and Research Development Corporation of Japan. Photomultiplier with plural photocathodes. 4,881,008, Cl. 313-532.000.

La Telemecanique Electrique: *See*—
Richard, Frecon, 4,880,994, Cl. 307-219.000.

Laak, Ursula E.: *See*—
Glasser, Joseph; and Laak, Ursula E., 4,880,333, Cl. 405-43.000.

Laboratoires, P.O.S.: *See*—
Andermann, Guy; Spittler, Joseph; Zilliox, Patricia; and Mergel, Dominique, 4,880,601, Cl. 422-28.000.

Lachey, Richard N., to Globe Products Inc. Wire supply method and apparatus. 4,880,173, Cl. 242-1.10R.

Lacolle, Jean-Yves: *See*—
Danree, Bernard; Faulques, Michelle; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, 4,880,807, Cl. 514-252.000.

Ladner, Robert C., to Genex Corporation. Computer based system and method for determining and displaying possible chemical structures for converting double- or multiple-chain polypeptides to single-chain polypeptides. 4,881,175, Cl. 364-496.000.

Lagerpusch, Klaus: *See*—
Grothaus, Ulrich; and Lagerpusch, Klaus, 4,881,134, Cl. 358-328.000.

Lailach, Gunter: *See*—
Dietz, Wolfgang; Gerken, Rudolf; Lailach, Gunter; and Clasen, Peter, 4,880,446, Cl. 55-71.000.

Laing, Karsten A.; Laing, Oliver P.; and Laing, Nikolaus J. Rotor with stabilizing magnets. 4,880,362, Cl. 417-365.000.

Laing, Nikolaus J.: *See*—
Laing, Karsten A.; Laing, Oliver P.; and Laing, Nikolaus J., 4,880,362, Cl. 417-365.000.

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Laing, Karsten A.; Laing, Oliver P.; and Laing, Nikolaus J., 4,880,362, Cl. 417-365.000.

Lajos, Jaroslav, to Honeywell Bull Inc. Apparatus and method for coordinating the front and back of a printer apparatus having two-sided printing capability. 4,881,132, Cl. 358-296.000.

Lake, Ralph J., Jr., to Unisys Corporation. Mounting arrangement for display terminal. 4,880,191, Cl. 248-371.000.

Lakey, George V.: *See*—
Horton, Robert L.; and Lakey, George V., 4,880,607, Cl. 423-20.000.

Lambert, Joseph M.: *See*—
Austill, Robert J.; and Lambert, Joseph M., 4,880,190, Cl. 246-107.000.

Lambropoulos, George; Pitera, Kenneth R.; and Hair, Robert A., to Wickes Manufacturing Company. Remote control system for door locks. 4,881,148, Cl. 361-172.000.

Lamer, Gerald P.: *See*—
Feider, Thomas; Lamer, Gerald P.; and Lenius, Norbert W., 4,880,124, Cl. 212-218.000.

Lampman, Richard L.: *See*—
Metcalf, Robert L.; and Lampman, Richard L., 4,880,624, Cl. 424-84.000.

Landis, Michael E.: *See*—
von Ballmoos, Roland; Chu, Cynthia T-W.; Landis, Michael E.; and Derouane, Eric G., 4,880,611, Cl. 423-306.000.

Landsman, Douglas A.: *See*—
Luczak, Francis J.; and Landsman, Douglas A., 4,880,711, Cl. 429-40.000.

Lang, James P. Flag pin golf ball distance measuring device. 4,880,232, Cl. 273-32.00B.

Langa, John M.; Boswell, Michael J.; and Littleton, Kermit R., to James Hardie Irrigation, Inc. Irrigation hose with linear turbulent flow emitter. 4,880,167, Cl. 239-542.000.

Lange, Walter F.: *See*—
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.

Lange, William J.: *See*—
Fey, Maurice G.; Lange, William J.; Freidhoff, Carl B.; and Slade, Paul G., 4,880,947, Cl. 200-144.00B.

Langen, Marinus J. M.; and Guttinger, Peter, to H. J. Langen & Sons Limited. Carton loading machines. 4,879,860, Cl. 53-247.000.

Langenfeld, Norbert: *See*—
Blank, Heinz U.; Langenfeld, Norbert; and Heydkamp, Wolfgang, 4,880,576, Cl. 562-828.000.

Lanham, Robert L.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,880,701, Cl. 428-34.200.

LaNieve, H. Leslie: *See*—
McNally, Donal; LaNieve, H. Lealie; and Costanzo, Jerome L., 4,880,866, Cl. 524-504.000.

Lanteri, Michael A. Combination headrest and wall with sliding window. 4,880,275, Cl. 297-391.000.

Larson, Marlow W., to Browning. Overdraw system for archery bows. 4,879,988, Cl. 124-41.00A.

Lasley, Robert D.: *See*—
Mentzer, Robert M., Jr.; Ely, Stephen W.; Lasley, Robert D.; and Berne, Robert M., 4,880,783, Cl. 514-46.000.

Lasto, Clifford S., to Air-Vac Engineering Company, Inc. Ultra-high vacuum force, low air consumption pumps. 4,880,358, Cl. 417-174.000.

Laszlo, Geza: *See*—
Palotas, Laszlo ; Laszlo, Geza; Horvath, Lazlo; Baria, Arpadne ; Marion, Barnabas; and Szarka, Ferencne , 4,880,208, Cl. 251-356.000.

Lathers, Michael W., to Outboard Marine Corporation. Convertible dinette/sleeper for recreational boat. 4,879,962, Cl. 114-188.000.

Laudon, Moshe: *See*—
Zisapel, Nava; and Laudon, Moshe, 4,880,826, Cl. 514-415.000.

Lauermann, Georg; and Thobe, Clemens, to Henkel Kommandigesellschaft auf Aktien. Taste of hens' eggs. 4,880,639, Cl. 426-2.000.

Lauffer, Randall B., to General Hospital Corporation, The. Vivo enhancement of NMR relaxivity. 4,880,008, Cl. 128-654.000.

Laurel Bank Machines Co., Ltd.: *See*—
Uchida, Shinya; Kohzu, Kazuya; Fujii, Kiyoshi; and Kawakami, Moriatsu, 4,881,268, Cl. 382-7.000.

Laurent, Douglas J.: *See*—
Hazelton, Donald R.; Laurent, Douglas J.; Locke, Lawrence K.; and Hodgson, William J., Jr., 4,880,682, Cl. 428-152.000.

Lawrie, George S., to Litton Systems, Inc. Optical touch panel with heat sink. 4,880,969, Cl. 250-221.000.

Lawter, Louise M. L.: *See*—
Byrne, Brian; and Lawter, Louise M. L., 4,880,641, Cl. 426-3.000.

Lazarus, Stanley D.: *See*—
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., 4,880,871, Cl. 525-43.000.

Leah, David A.: *See*—
Zalevsky, Harvey A.; and Leah, David A., 4,879,779, Cl. 15-104.920.

LeaRonal, Inc.: *See*—
Toben, Michael P.; Brown, Neil D.; Esterl, David J.; and Schetty, Robert A., 4,880,507, Cl. 204-44.400.

LeBeau, Phil E. Anti-burp nursing bottle combination. 4,880,125, Cl. 215-11.300.

Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, to Siemens Aktiengesellschaft. Digital interface of an integrated subscriber line interface circuit. 4,881,226, Cl. 370-110.100.

Leclerc, Roland P. Ladder cap. 4,880,079, Cl. 182-107.000.

Lee, Charles M., to Arabian American Oil Company. Method and apparatus for removing concrete coating from pipe. 4,880,335, Cl. 405-158.000.

Lee, Jimmy C.-M.: *See*—
Tanaka, Akira; and Lee, Jimmy C.-M., 4,880,084, Cl. 188-67.000.

Lee, Ora J.: *See*—
O'Dowd, James G.; Catalano, Anthony W.; Fortmann, Charles M.; and Lee, Ora J., 4,880,664, Cl. 427-109.000.

Leehey, Patrick, to Massachusetts Institute of Technology. Shear stress gauge. 4,879,899, Cl. 73-147.000.

Leemkuil, Hendrik; and Zilber, Eugene A., to Versa Corporation. Tilting reversible belt transfer mechanism. 4,880,099, Cl. 198-371.000.

Lefevre, Herve : *See*—
Vatoux, Sylvie; Papuchon, Michel; and Lefevre, Herve , 4,880,288, Cl. 350-96.120.

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Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.

Legros, Desire M.: *See*—
Floreancig, Eligio M.; Jandrain, Jean-Claude M.; Legros, Desire M.; and Simonon, Jean-Claude M., 4,879,933, Cl. 83-76.100.

Leiman, Basil C.; Butler, Bruce D.; Katz, Jeffrey; and Salzarulo, Henry H., to Board of Regents, The University of Texas System. Device for the determination of proper endotracheal tube placement. 4,879,999, Cl. 128-207.140.

Leinert, Herbert: *See*—
Bohm, Erwin; Holck, Jens-Peter; Kampe, Wolfgang; Leinert, Herbert; Muller-Beckmann, Bernd; and Strein, Klaus, 4,880,805, Cl. 514-237.500.

Leininger, Ernest; Blum, Leonard; and Ponte, Gary W., to Reliable Automatic Sprinkler Co., Inc., The. Adjustable concealed sprinkler. 4,880,063, Cl. 169-37.000.

Leisner, Ernst: *See*—
Drexel, Peter; Erne, Hans; Gosdowski, Gerhard; Gross, Karl; Kirsten, Ulrich; and Leisner, Ernst, 4,880,265, Cl. 294-86.400.

Leitko, Curtis E.: *See*—
McDonald, William J.; Wasson, Michael R.; Leitko, Curtis E.; Pittard, Gerard T.; and Maurer, William C., 4,880,065, Cl. 175-71.000.

Le-Khac, Bi, to Arco Chemical Technology, Inc. Extended shelf life water-absorbing composition which facilitates fiber formation. 4,880,868, Cl. 524-549.000.

Leland Stanford, Jr. University, Board of Trustees of: *See*—
Fejer, Martin M.; and Byer, Robert L., 4,880,297, Cl. 350-355.000.

Lelong, Pierre H.: *See*—
Jatteau, Michel R.; Lelong, Pierre H.; Pauzat, Vincent; and Plard, Christian, 4,881,171, Cl. 364-413.240.
Leneveu, Michel R. Golf training apparatus. 4,880,239, Cl. 273-181.00F.
Leng, Christine A.: *See*—
Leng, Francis J.; and Leng, Christine A., 4,880,569, Cl. 252-550.000.
Leng, Francis J.; and Leng, Christine A., to Lever Brothers Company. Concentrated liquid detergent composition containing anionic surfactants having non-terminal sulfonate groups. 4,880,569, Cl. 252-550.000.
Lenius, Norbert W.: *See*—
Feider, Thomas; Lamer, Gerald P.; and Lenius, Norbert W., 4,880,124, Cl. 212-218.000.
Lenk, Erich; and Stitz, Albert, to Barmag, AG. Yarn withdrawal apparatus. 4,880,177, Cl. 242-47.010.
Leon, Robert L., to Liberty Technology Center, Inc. System for evaluating the condition and performance of a valve and valve operator combination. 4,879,901, Cl. 73-168.000.
Leonhardt, Siegfried: *See*—
Nolte, Bert; and Leonhardt, Siegfried, 4,879,862, Cl. 53-438.000.
Lepak, Theodore: *See*—
Shemitz, Sylvan R.; Lepak, Theodore; and Smith, Steve, 4,881,156, Cl. 362-220.000.
Lepley, Roger M., to Kalamazoo Banner Works, Inc. Banner support. 4,880,195, Cl. 248-219.400.
Lerat, Bernard, to Commissariat A L'Energie Atomique. Transducer for bending and twisting moments. 4,879,913, Cl. 73-862.040.
Les Produits Associes, LPA SA: *See*—
Moret, Michel A.; and Jousson, Pierre J., 4,880,382, Cl. 433-118.000.
Lesk, Israel A.; and Clark, Lowell E., to Motorola Inc. Bipolar semiconductor device having a conductive recombination layer. 4,881,115, Cl. 357-64.000.
Lever Brothers Company: *See*—
Leng, Francis J.; and Leng, Christine A., 4,880,569, Cl. 252-550.000.
Lever, O. William, Jr.: *See*—
Kanojia, Ramesh M.; Lever, O. William, Jr.; and Press, Jeffery B., 4,880,817, Cl. 514-309.000.
Leverone, Marianne F.: *See*—
Matrozza, Mark A.; Leverone, Marianne F.; and Boudreaux, Donald P., 4,880,743, Cl. 435-252.400.
Levine, Morris M., to International Consumer Brands, Inc. Releasable battery pack cap and holder. 4,880,713, Cl. 429-100.000.
Levine, Neil A.: *See*—
Patterson, Dwight; and Levine, Neil A., 4,879,907, Cl. 73-861.050.
Levinson, Melvin L., to General Housewares Corporation. Food preparation kit for use in cooking food in microwave oven or in thermal oven. 4,880,951, Cl. 219-10.55E.
Lew, Chel W.; and Barlow, Darren E., to Southwest Research Institute. Encapsulated corn kernels and method of forming the same. 4,880,646, Cl. 426-93.000.
Lew, Hyok S. Vortex shedding flowmeter. 4,879,909, Cl. 73-861.240.
Lew, Hyok S. Torsional vibration convective inertia force flowmeter. 4,879,910, Cl. 73-861.370.
Lewis, Aaron: *See*—
Nebenzahl, Isaiah; and Lewis, Aaron, 4,880,496, Cl. 156-643.000.
Lewis, John F. Putting practice device. 4,880,240, Cl. 273-188.00R.
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Hasl, Siegfried C.; and Lisnet, Charles J., 4,880,368, Cl. 425-116.000.
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Miller, Lane R., 4,881,172, Cl. 364-424.050.
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Grollier, Jean F.; Dubief, Claude; and Mondet, Jean, 4,880,618, Cl. 424-43.000.
Vanlerberghe, Guy; and Sebag, Henri, 4,880,620, Cl. 424-70.000.

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Reinagel, Frederick G., 4,881,162, Cl. 364-176.000.

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Davari, Bijan; Hwang, Wei; and Lu, Nicky C., 4,881,105, Cl. 357-23.400.

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Kostusyk, Joseph L.; and Rizvi, Syed Q. A., 4,880,553, Cl. 252-58.000.

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Fuller, Robert G., 4,880,075, Cl. 180-219.000.

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Lombard, Jose O., 4,880,347, Cl. 414-542.000.

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Credali, Lino; Mulas, Carlo; Benetti, Ermanno; and Lunardon, Gianflavio, 4,880,847, Cl. 521-157.000.

Lungu, Corneliu, to Robert Bosch GmbH. Magnetic valve. 4,880,206, Cl. 251-129.210.

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Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurrsen, Klaus, 4,880,932, Cl. 544-320.000.

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Barkalow, Raymond W.; Dick, Harold S.; and Guthrie, Roger T., 4,879,970, Cl. 118-719.000.

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Yamaguchi, Hitoshi, 4,881,002, Cl. 310-261.000.

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Neff, James A., 4,880,033, Cl. 137-625.650.

Macabasco, Agilio E.: *See*—
Kuhlemann, Bruce W.; Macabasco, Agilio E.; and Salumbides, Renato R., 4,880,425, Cl. 604-404.000.

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Sarasola, Javier A., 4,880,109, Cl. 198-833.000.

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Bellingham, James G.; and MacVicar, Margaret L. A., 4,881,037, Cl. 324-425.000.

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Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.

Madigan, Stephen M. Energy efficient frost-free refrigerator. 4,879,881, Cl. 62-447.000.

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Maeda, Naoki, to Sumitomo Electric Industries, Ltd. Binary coding circuit. 4,881,188, Cl. 364-713.000.

Maeda, Yukio, to Matsushita Electric Industrial Co., Ltd. Method for mounting electronic parts. 4,880,486, Cl. 156-273.500.

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Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; Torichigai, Masaaki; and Koizumi, Kiyoshi, to Kansai Electric Power Co., Inc., The; and Mitsubishi Jukogyo Kabushiki Kaisha. Automatic tube circumference scanning apparatus. 4,879,973, Cl. 122-379.000.

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Harney, William J. J., 4,880,199, Cl. 248-396.000.

Magnet PLC: *See*—
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Magni Systems, Inc.: *See*—
Judge, John L., 4,881,121, Cl. 358-10.000.

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Fedeli, Jean-Marc; and Magnin, Joel, 4,881,198, Cl. 365-12.000.

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Muller, Kurt; and Mahler, Hansjurg, 4,880,980, Cl. 250-353.000.

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Malekos, George E. Adjustable head support for telephone handsets. 4,881,256, Cl. 379-449.000.

Mallinckrodt, Inc.: *See*—
Burnett, Thomas W.; Clary, Thomas R.; Iannuzzelli, Vincent F.; and Kremer, Carl P., Jr., 4,880,989, Cl. 250-506.100.

Mallon, Joseph R., Jr.: *See*—
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Malon, Raymond F.: *See*—
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Man Design Co., Ltd.: *See*—
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Manca, Marcello: *See*—
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Manenti, Luciano: *See*—
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Mangir, Metin S.: *See*—
Rockwell, David A.; Mangir, Metin S.; White, Jeffrey O.; and Jones, Dennis C., 4,880,295, Cl. 350-354.000.

Manker, Charles F., to Prism Technologies, Inc. Method of recharging a heat pack by microwave energy. 4,880,953, Cl. 219-10.55M.

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Mansion Industries, Inc.: *See*—
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Marano, Gerald A.: *See*—
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Marcelin, George: *See*—
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Marcon, Louis: *See*—
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Marcus, Bonita K.: *See*—
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Margolis, Arthur A. Active shadow mask color CRT. 4,881,016, Cl. 315-376.000.

Marine Travelift, Inc.: *See*—
Feider, Thomas; Lamer, Gerald P.; and Lenius, Norbert W., 4,880,124, Cl. 212-218.000.

Marion, Barnabas: *See*—
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Markey, John K., to Yale University. High pressure xenon ionization detector. 4,880,983, Cl. 250-385.100.

Markus, Isidoro N. Reclining chair having suspended seating. 4,880,273, Cl. 297-325.000.

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Marsh, Harry: *See*—
Haines, Derrick J.; and Marsh, Harry, 4,880,320, Cl. 384-215.000.

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Martindell, J. Richard. Storage and display apparatus for power bits. 4,880,122, Cl. 211-70.600.

Martinez-Vera, Enrique R.; and Becerra-Novoa, Jorge O., to Hylsa, S.A. de C.V. Start-up method for a direct reduction process without an external reformer. 4,880,458, Cl. 75-35.000.

Martini, Francesco; Perazzo, Luigi; and Vietto, Paolo, to W. R. Grace & Co.-Conn. Manufacture of polymeric products. 4,880,592, Cl. 264-514.000.

Marton, Jeno: *See*—
Knoll, Jozsef; Birkmayer, Walter; Kalloy, Katalin; Marton, Jeno; and Ecsery, Zoltan, 4,880,833, Cl. 514-565.000.

Martz, Martin G. Orthodonture appliance which may be manually installed and removed by the patient. 4,880,380, Cl. 433-11.000.

Maruta, Fumio: *See*—
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, 4,880,687, Cl. 428-141.000.

Maschinenfabrik Ad. Schulthess & Co. AG: *See*—
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Jensen, Svend; Paul, David S.; and Appleyard, Michael, 4,880,269, Cl. 296-190.000.

Massey, Robert H.: *See*—
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.

Massimo, Calanchi: *See*—
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Mathers, Terrence L. Method and apparatus for producing high vacuum. 4,880,357, Cl. 417-77.000.

Matko, Janos: *See*—
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Matrone, Harry A.: *See*—
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Matrozza, Mark A.; Leverone, Marianne F.; and Boudreaux, Donald P., to Microlife Technics, Inc. Bacterial composition for inhibiting psychrotrophic bacteria in cream or milk based products. 4,880,743, Cl. 435-252.400.

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Suzuki, Tsutomu; Seko, Tatsushi; Tobita, Kuniharu; Matsubayashi, Saburo; Kougo, Nobuhiko; Ogawa, Kiyoshi; Taniguchi, Susumu; Minami, Masaharu; Hayakawa, Masayuki; and Kawada, Noriyuki, 4,879,788, Cl. 26-94.000.

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Matsuda, Shigeki; Mori, Kazuhiko; Gotou, Wataru; and Ohnuki, Takahiro, to Nippondenso Co., Ltd.; and Nihon Parkerizing Co., Ltd. Process for the phosphate chemical conversion treatment of a steel material. 4,880,476, Cl. 148-253.000.

Matsueda, Hideaki: *See*—
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Matsui, Isamu; Uchida, Hiroshi; Otojima, Hirao; and Kino, Yoshihiro, to Murata Kikai Kabushiki Kaisha. Yarn end finding device. 4,880,176, Cl. 242-35.60E.

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Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Ohnishi, Hiroshi, 4,880,142, Cl. 222-56.000.

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Matsui, Susumu: *See*—
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Matsumoto, Eiichi, to Nissan Motor Co., Ltd. Oil pump driving mechanism. 4,879,981, Cl. 123-198.00C.

Matsumoto, Hisao, to Matsumoto Kokan Co., Ltd. Lock nut having lock member of shape memory recovery alloy. 4,880,343, Cl. 411-222.000.

Matsumoto Kokan Co., Ltd.: *See*—
Matsumoto, Hisao, 4,880,343, Cl. 411-222.000.

Matsumoto, Osamu; Sumida, Mamoru; and Maehara, Hirokazu, to Mitsubishi Denki Kabushiki Kaisha. Intake throttle valve return device of engine. 4,880,207, Cl. 251-337.000.

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Matsumoto, Satoshi: *See*—
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, 4,881,196, Cl. 364-900.000.

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Matsunaga, Yuuichi: *See*—
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Kitami, Tetsu; and Mito, Jun, 4,880,036, Cl. 138-137.000.
Mitomo, Ryuji: *See*—
Nakagawa, Susumu; Mitomo, Ryuji; and Ushijima, Ryosuke, 4,880,797, Cl. 514-206.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Baba, Fumiaki, 4,880,591, Cl. 264-327.000.
Hirai, Hayao, 4,881,021, Cl. 318-569.000.
Matsumoto, Osamu; Sumida, Mamoru; and Maehara, Hirokazu, 4,880,207, Cl. 251-337.000.
Mori, Satoshi; and Majumdar, Gourab, 4,880,995, Cl. 307-270.000.
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,880,975, Cl. 250-306.000.
Niwayama, Kazuhiko; Nakagawa, Tsutomu; Tokunoh, Futoshi; and Yoshida, Shigekazu, 4,881,118, Cl. 357-79.000.
Sengoku, Yukinori, 4,879,967, Cl. 118-259.000.
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,879,983, Cl. 123-339.000.

Tadokoro, Michihiro; Imai, Hitoshi; and Okada, Kazuo, 4,881,204, Cl. 369-46.000.
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, 4,881,196, Cl. 364-900.000.
Ueda, Masahiro, 4,880,998, Cl. 307-446.000.
Yoshida, Takayuki; Fujii, Masao; and Sakuma, Kiyoshi, 4,880,054, Cl. 165-133.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; Torichigai, Masaaki; and Koizumi, Kiyoshi, 4,879,973, Cl. 122-379.000.
Suzuki, Tsutomu; Seko, Tatsushi; Tobita, Kuniharu; Matsubayashi, Saburo; Kougo, Nobuhiko; Ogawa, Kiyoshi; Taniguchi, Susumu; Minami, Masaharu; Hayakawa, Masayuki; and Kawada, Noriyuki, 4,879,788, Cl. 26-94.000.

Mitsubishi Kasei Corporation: *See*—
Ninomiya, Kunihiro; Saito, Ken-Ichi; Morita, Shuji; Tobe, Akihiro; and Nitta, Issei, 4,880,819, Cl. 514-316.000.

Mitsubishi Paper Mills: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,880,767, Cl. 503-217.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; Suzuki, Fumio; Habara, Hideaki; Fukuda, Yutaro; and Sato, Haruki, 4,880,877, Cl. 525-84.000.

Mitsuhashi, Yasuhiro, to Keihin Co., Ltd. Facsimile interface device for land-mobile telephones. 4,881,129, Cl. 358-434.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Hashimoto, Koji; Miura, Kimikado; Asami, Katsuhiko; and Kawashima, Asahi, 4,880,482, Cl. 148-403.000.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Yamada, Shinjiro, 4,880,263, Cl. 292-216.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kiso, Yoshihisa; Matsunaga, Yuuichi; and Imagawa, Masao, 4,880,942, Cl. 549-228.000.
Sagane, Toshihiro, 4,880,873, Cl. 525-61.000.
Shigemoto, Hiromi; Abe, Shunji; and Yamamoto, Akio, 4,880,589, Cl. 264-216.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Aoki, Masaaki; Tani, Mayumi; Kamiyama, Masayuki; and Asai, Kiyotsugu, 4,880,869, Cl. 524-773.000.
Fujimura, Tatsuhito; and Sakurai, Motoi, 4,880,744, Cl. 435-240.460.

Mitsumoto, Yoshio: *See*—
Hirai, Kazumi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; and Hori, Ichiroh, 4,880,952, Cl. 219-10.55B.

Miura, Hiroki: *See*—
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, 4,881,196, Cl. 364-900.000.

Miura, Kimikado: *See*—
Hashimoto, Koji; Miura, Kimikado; Asami, Katsuhiko; and Kawashima, Asahi, 4,880,482, Cl. 148-403.000.

Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, to Takeda Chemical Industries Ltd.; and Nippon Steel Corporation. One-can thermosetting resin compositions and precoated metal. 4,880,890, Cl. 528-45.000.

Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, to Takeda Chemical Industries, Ltd.; and Nippon Steel Corporation. One-can thermosetting resin compositions and precoated metal. 4,880,891, Cl. 528-45.000.

Miyabe, Asao: *See*—
Sakai, Yoshikatsu; Nakai, Yasuo; Miyabe, Asao; and Kawano, Takafumi, 4,881,160, Cl. 364-161.000.

Miyajima, Takeshi: *See*—
Mizukoshi, Masahito; Kawasaki, Eishi; Miyajima, Takeshi; and Fukazawa, Takeshi, 4,881,056, Cl. 338-4.000.

Miyamoto, Hisashi: *See*—
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,880,806, Cl. 514-249.000.

Miyamoto, Tetsuya: *See*—
Harada, Naoki; Miyamoto, Tetsuya; Imada, Kunihiko; and Omura, Takashi, 4,880,434, Cl. 8-549.000.

Miyashita, Kunio: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.

Miyata, Souichi: *See*—
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, 4,881,196, Cl. 364-900.000.

Miyatake, Yoshiteru: *See*—
Ishida, Yasumasa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.

Miyauchi, Masahiro: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,880,767, Cl. 503-217.000.

Miyazaki, Hiroharu: *See*—
Makino, Nobuhiko; Tamura, Kimio; Miyazaki, Hiroharu; Hosoda, Tomohiko; and Nakagawa, Fumio, 4,880,282, Cl. 303-116.000.

Miyazawa, Osamu: *See*—
Ushio, Jiro; Miyazawa, Osamu; Yokono, Hitoshi; and Tomizawa, Akira, 4,880,464, Cl. 106-1.050.

Mizukoshi, Masahito; Kawasaki, Eishi; Miyajima, Takeshi; and Fukazawa, Takeshi, to Nippondenso Co., Ltd. Facedown-type semiconductor pressure sensor with spacer. 4,881,056, Cl. 338-4.000.

Mizusawa, Shigeru: *See*—
Meguro, Hiroshi; Yamamoto, Yoshinori; Ohyama, Masao; Horikawa, Kenichi; Mizusawa, Shigeru; and Kawakami, Kenji, 4,881,137, Cl. 360-96.500.

Mizutani, Futoshi: *See*—
Kanamori, Hiroo; Tanaka, Gotaro; Kyoto, Michihisa; Yoshioka, Naoki; and Mizutani, Futoshi, 4,880,452, Cl. 65-3.120.

Moake, Joel L.; Phillips, Martin D.; McIntire, Larry V.; and Hellums, Jesse D., to Baylor College of Medicine. Method for preventing and treating thrombosis. 4,880,788, Cl. 514-150.000.

Mobay Corporation: *See*—
Paul, Winfried G.; Price, Ronald L.; and Krishnan, Sivaram, 4,880,864, Cl. 524-404.000.
Saad, Elie E., 4,880,463, Cl. 75-257.000.

Mobil Oil Corporation: *See*—
Altman, Lawrence J.; Choi, Byung C.; and Karsner, Grant C., 4,880,748, Cl. 436-60.000.
Audeh, Costandi A., 4,880,527, Cl. 208-251.00R.
Belmont, Kirk E.; Bullard, Edward M.; DiBiasi, Daniel J.; Forman, Edward W., Jr.; and McIntyre, David E., 4,880,316, Cl. 383-75.000.
Bloomquist, Marvin G.; and Warner, Barry N., 4,881,209, Cl. 367-52.000.
Bundens, Robert G.; and Herbst, Joseph A., 4,880,787, Cl. 502-65.000.
Goulette, Stephen L., 4,880,178, Cl. 242-58.100.
Mazuera, Gonzalo E.; and Wagner, John R., Jr., 4,880,706, Cl. 428-516.000.
Savins, J. George; Hugenberger, Scott G.; and Wilson, Peggy M., 4,880,444, Cl. 55-36.000.
von Ballmoos, Roland; Chu, Cynthia T-W.; Landis, Michael E.; and Derouane, Eric G., 4,880,611, Cl. 423-306.000.

Mobley, Lawrence R., to Samsonite Corporation. Trolley with hanger retaining structure which inhibits unintended hanger withdrawal. 4,880,113, Cl. 206-287.000.

Mochida, Ei: *See*—
Kato, Kazuo; Murakami, Kimihiro; Mochizuki, Hidenori; and Mochida, Ei, 4,880,798, Cl. 514-206.000.

Mochida Pharmaceutical Co., Ltd.: *See*—
Kato, Kazuo; Murakami, Kimihiro; Mochizuki, Hidenori; and Mochida, Ei, 4,880,798, Cl. 514-206.000.

Mochizuki, Hidehiro; Imamura, Masanaga; Suzuki, Akira; Shimada, Masaru; and Uemura, Hiroyuki, to Ricoh Company, Ltd. Sublimation type thermosensitive image transfer recording medium. 4,880,768, Cl. 503-227.000.

Mochizuki, Hidenori: *See*—
Kato, Kazuo; Murakami, Kimihiro; Mochizuki, Hidenori; and Mochida, Ei, 4,880,798, Cl. 514-206.000.

Mochizuki, Shigehiko; Kanda, Masahiro; and Serizawa, Yoshinori, to Yazaki Corporation. Ignition plug connector and manufacturing method. 4,880,389, Cl. 439-125.000.

Moellers, Chris M., to Litton Systems, Inc. Balanced exhalation valve for use in a closed loop breathing system. 4,879,998, Cl. 128-205.240.

Mohsen, Amr M.; Hamdy, Esmat Z.; and McCollum, John L., to Actel Corporation. Selectively formable vertical diode circuit element. 4,881,114, Cl. 357-54.000.

Moisson, Marc F. L.: *See*—
Sovish, Richard C.; Selleslags, Frank K. A.; and Moisson, Marc F. L., 4,879,799, Cl. 29-447.000.

Moji & Co., Ltd.: *See*—
Moji, Eirou, 4,880,393, Cl. 439-352.000.

Moji, Eirou, to Moji & Co., Ltd. Connector with locking mechanism. 4,880,393, Cl. 439-352.000.

Molitorisz, Joseph. Hydraulic reservoir. 4,880,503, Cl. 165-47.000.

Moll, Reiner; and Utz, Andreas, to Planmoebel Eggersman GmbH & Co. KG. Office workstation. 4,879,955, Cl. 108-50.000.

Molnlycke AB: *See*—
Widlund, Urban, 4,880,421, Cl. 604-385.200.

Moltner, Hermann: *See*—
Holthoff, Helmut; and Moltner, Hermann, 4,879,924, Cl. 74-799.000.

Momany, Frank A., to Eastman Kodak Company. Synthetic peptides having growth hormone releasing activity. 4,880,777, Cl. 514-12.000.

Momany, Frank A.: *See*—
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne; Hubbs, John C.; and Foster, Charles H., 4,880,778, Cl. 514-12.000.

Momodomi, Masaki; Ogura, Mitsugi; and Kumanomido, Takaki, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuits with a protection device. 4,881,113, Cl. 357-51.000.

Mondet, Jean: *See*—
Grollier, Jean F.; Dubief, Claude; and Mondet, Jean, 4,880,618, Cl. 424-43.000.

Monserbio: *See*—
Courregelongue, Jean; and Maffrand, Jean-Pierre, 4,880,573, Cl. 260-420.000.

Monterosso, Gianpaolo; Marazzi, Riccardo; Nicotra, Mario; and Manenti, Luciano, to Nicotra Sistemi S.p.A. Transducer for measuring one or more physical quantities or electric variables. 4,881,071, Cl. 340-870.130.

Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Sands, Keith P., to International Flavors & Fragrances Inc. Flavoring with schiff base reaction products of alkyl anthranilates. 4,880,640, Cl. 426-3.000.

Mookherjee, Braja D.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,880,625, Cl. 424-84.000.

Moore, Richard C.: *See*—
Mishra, Anupama; and Moore, Richard C., 4,880,828, Cl. 514-438.000.

Moore, Sewell T.; and Brevard, William, to American Cyanamid Company. Dry strength resin of amino/aldehyde acid colloid with acrylamide polymer, process for the production thereof and paper produced therefrom. 4,880,498, Cl. 162-164.600.

Morbitzer, Hans P.: *See*—
Nowak, Gerhard; Kruschik, Klaus; Morbitzer, Hans P.; Theuer, Rudolf; and Winter, Alfred, 4,880,252, Cl. 280-618.000.

Moreau, Wayne M.; and Chiong, Kaolin N., to International Business Machines Corporation. Diazoquinone sensitized polyamic acid based photoresist compositions having reduced dissolution rates in alkaline developers. 4,880,722, Cl. 430-192.000.

Moret, Michel A.; and Jousson, Pierre J., to Les Produits Associes, LPA SA. Integrated oral hygiene system. 4,880,382, Cl. 433-118.000.

Mori, Kazuhiko: *See*—
Matsuda, Shigeki; Mori, Kazuhiko; Gotou, Wataru; and Ohnuki, Takahiro, 4,880,476, Cl. 148-253.000.

Mori, Sadao: *See*—
Ishida, Yasumasa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.

Mori, Satoshi; and Majumdar, Gourab, to Mitsubishi Denki Kabushiki Kaisha. Electrically isolated MOSFET drive circuit. 4,880,995, Cl. 307-270.000.

Mori, Seiichiro: *See*—
Tomita, Ken; and Mori, Seiichiro, 4,880,977, Cl. 205-311.000.

Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Carbon black-graft polymer, method for production thereof, and use thereof. 4,880,857, Cl. 523-205.000.

Morimoto, Kiyoshi; Watanabe, Hiroshi; Itoh, Shigeo; Ogawa, Yukio; and Uzawa, Satoshi, to Futaba Denshi Kogyo Kabushiki Kaisha. Flat type display device. 4,881,005, Cl. 313-422.000.

Morimoto, Makoto: *See*—
Kasai, Masaji; Kanda, Yutaka; Kono, Motomichi; Saito, Yutaka; Morimoto, Makoto; and Ashizawa, Tadashi, 4,880,825, Cl. 514-409.000.

Morioka, Yuji: *See*—
Itou, Tsukasa; Kawase, Ryuji; Morioka, Yuji; and Ichiba, Masao, 4,880,435, Cl. 29-623.500.

Morisada, Tsuyoshi, to NEC Corporation. Instruction prefetch control apparatus. 4,881,170, Cl. 364-200.000.

Morita, Hiroshi, to Seiko Instruments Inc. Plotter adjustment circuit. 4,881,131, Cl. 358-296.000.

Morita, Kouichi: *See*—
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,880,925, Cl. 544-105.000.

Morita, Seiji: *See*—
Uchida, Minoru; Morita, Seiji; Chihiro, Masatoshi; and Nakagawa, Kazuyuki, 4,880,815, Cl. 514-303.000.

Morita, Shuji: *See*—
Ninomiya, Kunihiro; Saito, Ken-Ichi; Morita, Shuji; Tobe, Akihiro; and Nitta, Issei, 4,880,819, Cl. 514-316.000.

Morita, Yoshitsugu; Yokoyama, Noriyasu; and Yoshida, Keiji, to Toray Silicone Company, Ltd. Curable resin composition containing a microparticulate silicone rubber. 4,880,882, Cl. 525-446.000.

Moriwaki, Eijin: *See*—
Yuito, Isamu; Moriwaki, Eijin; Shiiki, Kazuo; Hamakawa, Yoshihiro; and Takano, Hisashi, 4,881,144, Cl. 360-125.000.

Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurrsen, Klaus, to Bayer Aktiengesellschaft. Substituted guanidine derivatives. 4,880,932, Cl. 544-320.000.

Moriya, Koichi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; and Shibuya, Katsuhiko, 4,880,933, Cl. 544-332.000.

Moriya, Tetsuo: *See*—
Kondo, Susumu; Moriya, Tetsuo; and Aoyama, Hiroshi, 4,880,886, Cl. 526-80.000.

Moriyama, Yasuyuki, to Takara Co., Ltd. Cassette music box. 4,879,938, Cl. 84-95.200.

Morohashi, Katsuei: *See*—
Shimoma, Taketoshi; Morohashi, Katsuei; and Shimokobe, Jiro, 4,881,015, Cl. 315-371.000.

Morton, Douglas W., to Hewlett-Packard Company. Multichannel decimation/interpolation filter. 4,881,191, Cl. 364-724.130.

Mosca, Virgilio: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.1.

Moskowitz, David; and Phillips, Charles W., to Ford Motor Company. Method of making and using a titanium diboride comprising body. 4,880,600, Cl. 419-12.000.

Moss, Christopher T.; Tufts, Timothy A.; and Bock, Robert S., to Ashland Oil, Inc. Amino/ortho carboxylic acid ester catalyst system for isocyanate trimerization. 4,880,845, Cl. 521-114.000.

Moss, Christopher T.: *See*—
Tufts, Timothy A.; Bock, Robert S.; and Moss, Christopher T., 4,880,846, Cl. 521-129.000.

Moss, Gaylord E., to Hughes Aircraft Company. Complex conjugate hologram display. 4,880,287, Cl. 350-3.850.

Motegi, Toshio: *See*—
Haranoya, Tomoji; Motegi, Toshio; and Abe, Masaaki, 4,879,969, Cl. 118-638.000.

Motes, John M.: *See*—
Treybig, Duane S.; and Motes, John M., 4,880,934, Cl. 544-384.000.

Motorola, Inc.: *See*—
Gordecki, Richard J., 4,880,712, Cl. 429-97.000.
Graziano, Victor, 4,881,082, Cl. 342-432.000.
Jason, Barry L., 4,881,043, Cl. 330-252.000.
Lesk, Israel A.; and Clark, Lowell E., 4,881,115, Cl. 357-64.000.
Sharma, Ravinder K.; Geyer, Harry J.; and Mitchell, Douglas G., 4,880,708, Cl. 428-620.000.

Mouri, Takayuki: *See*—
Yamazaki, Hiroshi; Hara, Toshiyuki; Tanaka, Yuji; and Mouri, Takayuki, 4,880,264, Cl. 292-226.000.

MTA Kozponti Kemiai Kutato Intezete and BIOGAL Gyogyszergyar: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.

MTS Systems Corporation: *See*—
Meline, Harry R.; Meyer, Richard A.; and Kovacevic, Nebojsa D., 4,879,906, Cl. 73-826.000.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Greune, Christian, 4,880,244, Cl. 277-174.000.

Muel, Thomas; Tenud, Leander; Duc, Laurent; and McGarrity, John, to Lonza Ltd. 4-alkoxy-3-pyrrolin-2-on-1-yl acetic acid alkyl esters. 4,880,940, Cl. 548-544.000.

Mueller, Otward M.: *See*—
Bottomley, Paul A.; Roemer, Peter B.; Edelstein, William A.; and Mueller, Otward M., 4,881,032, Cl. 324-309.000.

Mueller, Rudi: *See*—
Reichbauer, Hermann; Mueller, Rudi; and Riccato, Aldo, 4,881,074, Cl. 340-825.050.

Mugnolo, Anthony: *See*—
Mugnolo, Frank A.; Mugnolo, Anthony; and Calabrese, Joseph A., 4,880,262, Cl. 292-202.000.

Mugnolo, Frank A.; Mugnolo, Anthony; and Calabrese, Joseph A., to Mugnolo, Frank A. Door latch. 4,880,262, Cl. 292-202.000.

Mulas, Carlo: *See*—
Credali, Lino; Mulas, Carlo; Benetti, Ermanno; and Lunardon, Gianflavio, 4,880,847, Cl. 521-157.000.

Muller-Beckmann, Bernd: *See*—
Bohm, Erwin; Holck, Jens-Peter; Kampe, Wolfgang; Leinert, Herbert; Muller-Beckmann, Bernd; and Strein, Klaus, 4,880,805, Cl. 514-237.500.

Muller, Felix: *See*—
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Muller, Kurt; and Mahler, Hansjurg, to Cerberus AG. Intrusion detector. 4,880,980, Cl. 250-353.000.

Muller, Olaf, to R. Schmidt GmbH. Adjustable guide for a vehicle safety belt. 4,880,254, Cl. 280-808.000.

Muller, Peter. Method and apparatus for preventing the attachment of foreign bodies to controllable pitch propeller linkages of watercraft. 4,880,402, Cl. 440-50.000.

Mullins, Michael J.; Crain, Steven P.; Woo, Edmund P.; and Murray, Daniel J., to Dow Chemical Company, The. Poly(aryl ether)-poly(aryl carbonate) block copolymers and their preparation. 4,880,884, Cl. 525-469.000.

Munz, Gunter: *See*—
Dorge, Franz; Erlenmayer, Udo; Faber, Bernd; Herty, Winfried; and Munz, Gunter, 4,880,259, Cl. 285-137.100.

Murabayashi, Kazushige: *See*—
Hojo, Takeshi; Yamamoto, Kanshi; Kawada, Shinichi; Murabayashi, Kazushige; Akimoto, Mamoru; and Fukano, Michio, 4,879,918, Cl. 74-5.470.

Murai, Yoshio: *See*—
Isoguchi, Seiichi; Murai, Yoshio; Takayama, Jun; and Nagaishi, Katsuya, 4,881,127, Cl. 358-213.190.

Murakami, Kanji. Three-dimensional shooting video camera apparatus. 4,881,122, Cl. 358-88.000.

Murakami, Kimihiro: *See*—
Kato, Kazuo; Murakami, Kimihiro; Mochizuki, Hidenori; and Mochida, Ei, 4,880,798, Cl. 514-206.000.

Murakami, Koji; Higeta, Kazuya; and Touchi, Hachiro, to Chugai Ro. Co., Ltd. Method of measuring temperature and apparatus for effecting the method. 4,881,185, Cl. 364-557.000.

Muramatsu, Tadao: *See*—
Kito, Shozo; Harada, Shoichi; Imai, Hajime; Ohta, Hisatoshi; Suzuki, Masamitsu; and Muramatsu, Tadao, 4,880,092, Cl. 192-4.00A.

Murashige, Shinichi: *See*—
Nakamura, Hideaki; Shimamori, Tamotsu; and Murashige, Shinichi, 4,881,039, Cl. 328-26.000.

Murata Kikai Kabushiki Kaisha: *See—*
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Matsui, Isamu; Uchida, Hiroshi; Otojima, Hirao; and Kino, Yoshihiro, 4,880,176, Cl. 242-35.60E.
Yamauchi, Tosio; Tone, Shoichi; and Ueda, Yutaka, 4,880,175, Cl. 242-35.50R.

Murata, Masahiro; and Takahashi, Kaoru, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for closing openings of through-holes in a pipe wall. 4,880,579, Cl. 264-26.000.

Murdoch, Ian S., to American Standard Inc. Method of installing a bathing vessel. 4,879,858, Cl. 52-741.000.

Murofushi, Toshiaki; Nakazawa, Hiroshi; Oyamada, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; and Ohya, Yasuhiro, to Fuji Xerox Co., Ltd. Two component electrophotographic developer. 4,880,719, Cl. 430-106.600.

Murphy, Bernard J., to Ingersoll-Rand Company. Method of checking collinearity. 4,880,306, Cl. 356-153.000.

Murphy, Kevin C. Braille teaching apparatus. 4,880,384, Cl. 434-113.000.

Murphy, Milton K.: *See—*
Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handerman, Alan C.; Cruse, Clint A.; and Malon, Raymond F., 4,880,441, Cl. 55-16.000.

Murphy Oil Company Limited: *See—*
Bland, Linden; and Anderson, Clifford J., 4,880,062, Cl. 166-371.000.

Murray, Alexander P.; Slater, Clifton G.; and White, Robert W., to Westinghouse Electric Corp. Ceric acid decontamination of nuclear reactors. 4,880,559, Cl. 252-186.210.

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Mullins, Michael J.; Crain, Steven P.; Woo, Edmund P.; and Murray, Daniel J., 4,880,884, Cl. 525-469.000.

Murray, Pat L.; Braun, Robert; and McNamara, Dawn, to Insta-Foam Products. Dispenser and components for high viscosity foam products. 4,880,143, Cl. 222-135.000.

Musselmann, Walter: *See—*
Meinecke, Albrecht; and Musselmann, Walter, 4,880,532, Cl. 209-268.000.

Myers, David R.: *See—*
Ashby, Carol I. H.; Myers, David R.; and Vook, Frederick L., 4,880,493, Cl. 156-628.000.

Myers, Michael J.; and Harwick, Warren J., to Coca-Cola Company, The. Plastic container inspection process. 4,880,120, Cl. 209-3.100.

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Min, Sung-Ki; Myung, Chan-Kyu; and Shin, Ki-Ho, 4,881,042, Cl. 329-326.000.

Nabetani, Shinji: *See—*
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Nabisco Brands, Inc.: *See—*
Spinelli, Louis A.; and Jenniges, Jeffrey M., 4,880,371, Cl. 425-135.000.

Nadaradjane, Ramatchandirane: *See—*
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.

Nagaishi, Katsuya: *See—*
Isoguchi, Seiichi; Murai, Yoshio; Takayama, Jun; and Nagaishi, Katsuya, 4,881,127, Cl. 358-213.190.

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Nagaoka, Shinji: *See—*
Ogihara, Masuo; Ishida, Hiroyuki; Nagaoka, Shinji; Seki, Youichi; Tagami, Shigeru; Yamazaki, Hiroshi; and Shinozaki, Nobuo, 4,881,096, Cl. 354-400.000.

Nagasaki, Tatsuo: *See—*
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Nagashima, Shigeo: *See—*
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Nagata, Atsushi, to Toyoda Gosei Co., Ltd. Steering wheel. 4,879,923, Cl. 74-552.000.

Nagata, Kenzo: *See—*
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Nagata, Minoru: *See—*
Kinoshita, Taizo; Tanaka, Satoshi; Tanaka, Hirotoshi; Kotera, Nobuo; and Nagata, Minoru, 4,881,044, Cl. 330-253.000.

Naito, Kazuo: *See—*
Yoshikawa, Masato; Kusano, Yukihiro; Naito, Kazuo; Honda, Toshio; and Hata, Tomonobu, 4,880,515, Cl. 204-192.120.

Najjar, Mitri S.; and Robin, Allen M., to Texaco Inc. High temperature desulfurization of synthesis gas. 4,880,439, Cl. 48-197.00R.

Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, to Kabushiki Kaisha Toshiba. Conductive modulated MOSFET. 4,881,120, Cl. 357-23.400.

Nakagawa, Fumio: *See—*
Makino, Nobuhiko; Tamura, Kimio; Miyazaki, Hiroharu; Hosoda, Tomohiko; and Nakagawa, Fumio, 4,880,282, Cl. 303-116.000.

Nakagawa, Kazuyuki: *See—*
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Nakagawa, Kenji, to Fujitsu Limited. Deformation free X-ray exposure mask for X-ray lithography. 4,881,257, Cl. 378-35.000.

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Inoue, Takeshi; Funabashi, Hiroshi; and Nakagawa, Yukihiro, 4,880,078, Cl. 181-232.000.

Nakagawa, Susumu; Mitomo, Ryuji; and Ushijima, Ryosuke, to Banyu Pharmaceutical Co., Ltd. Cephalosporin derivatives and antibacterial agents. 4,880,797, Cl. 514-206.000.

Nakagawa, Takayuki: *See—*
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Nakagawa, Tsutomu: *See—*
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Nakagoshi, Kazuo: *See—*
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Nakai, Yasuo: *See—*
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Nakajima, Hiroharu: *See—*
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Yamamoto, Masato; Nakajima, Masahiro; and Yamanaka, Toshimasa, 4,881,098, Cl. 354-403.000.

Nakamura, Gary D.; and Stephenson, Jerry D., to Boeing Company, The. Thermal management system. 4,880,050, Cl. 165-41.000.

Nakamura, Hideaki; Shimamori, Tamotsu; and Murashige, Shinichi, to Omron Tateisi Electronics Company. Transducer and related circuitry. 4,881,039, Cl. 328-26.000.

Nakamura, Hisanori: *See—*
Yomogida, Toshihiko; Yamashita, Tsuyoshi; Yamamoto, Shigeo; Tobita, Hideaki; Nakamura, Hisanori; and Kobayashi, Goro, 4,881,220, Cl. 370-16.000.

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Nakamura, Minoru: *See—*
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Nakamura, Morio: *See—*
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Nakamura, Ryuji, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling. 4,880,095, Cl. 192-58.00B.

Nakamura, Shinya: *See—*
Asada, Toshiyuki; Kubo, Seitoku; Nakamura, Shinya; Kinoshita, Masafumi; and Kuroda, Takaaki, 4,879,921, Cl. 74-467.000.

Nakamura, Takeaki: *See—*
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Nakane, Kazunori: *See—*
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Nakanishi, Kenji: *See—*
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Nakano, Shoji: *See—*
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Nakayama, Atsushi: *See—*
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Nakazawa, Hiroshi: *See*—
Murofushi, Toshiaki; Nakazawa, Hiroshi; Oyamada, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; and Ohya, Yasuhiro, 4,880,719, Cl. 430-106.600.

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Kijima, Toshio; Tezuka, Tokuya; Doi, Yoji; Yamashita, Shuiichi; Namba, Shigetoh; and Arie, Tsutomu, 4,880,745, Cl. 435-253.300.

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Matsumura, Shoichi; Nanbu, Toshiro; and Furukawa, Hisao, 4,880,861, Cl. 524-314.000.

Naoi, Satoshi: *See*—
Akagawa, Minoru; Naoi, Satoshi; and Fukumoto, Heijiro, 4,880,518, Cl. 204-298.000.

Naraghi, Ali R., to Champion Chemicals, Inc. Chelate catalyst system for H_2S removal from a gas stream. 4,880,609, Cl. 423-226.000.

Narita, Mitsuru: *See*—
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National Research Development Corporation: *See*—
Allen, William M.; Sansom, Bernard F.; Wilson, Alan D.; Prosser, Havard J.; and Groffman, David M., 4,880,628, Cl. 424-605.000.

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Navin, James P.; Shilhavy, Ronald A.; and Christensen, Gary M., to Spee-Dee Packaging Machinery Inc. Filling machine for dispensing particulate material. 4,880,150, Cl. 222-346.000.

Naylor Industrial Services, Inc.: *See*—
Bloch, Christopher J., 4,880,447, Cl. 55-94.000.

NCR Corporation: *See*—
Coffey, James B., 4,880,159, Cl. 239-1.000.
Steele, David P., 4,880,997, Cl. 307-443.000.

Nebenzahl, Isaiah; and Lewis, Aaron. Method and device for submicron precision pattern generation. 4,880,496, Cl. 156-643.000.

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Korechika, Masako, 4,881,248, Cl. 377-17.000.
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Tanaka, Shigenobu; and Arai, Tomohisa, 4,881,169, Cl. 364-200.000.
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Neff, James A., to MAC Valves, Inc. Poppet valve. 4,880,033, Cl. 137-625.650.

Nelson, John A.; and Stout, Gregg W., to Baker Oil Tools, Inc. Hydraulically activated firing head for well perforating guns. 4,880,056, Cl. 166-51.000.

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Nelson, Maynard E. Fishing lure/hook receptacle. 4,879,832, Cl. 43-25.200.

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Peck, James V.; and Minaskanian, Gevork, 4,880,924, Cl. 540-520.000.

Nemirovsky, Robert, to Nemirovsky, Robert; and Deutsch, Joseph. Tilting apparatus. 4,880,219, Cl. 269-60.000.

Neou, In-Meei. Evaporative emission control of liquid storage tanks using bellow sealing systems. 4,880,135, Cl. 220-85.0VS.

Nernberger, Lee: *See*—
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Nesbitt, R. Dennis: *See*—
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Ness, Irving S., to Chicopee. Absorbent article with internal wicking means. 4,880,419, Cl. 604-368.000.

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Luddy, Francis E.; and Longhi, Sergio, 4,880,658, Cl. 426-607.000.

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Neumann, Peter: *See*—
Leyrer, Reinhold J.; and Neumann, Peter, 4,880,718, Cl. 430-58.000.

Neuwirth, Helmuth; and Meyerhofer, Carl H., to Porta Systems Corp. Protector module for quick clip terminal telephone connector blocks. 4,881,255, Cl. 379-412.000.

New, James S. Psychotropic acyclic amide derivatives. 4,880,930, Cl. 544-295.000.

Newman, Thomas H.; Henton, David E.; and Evans, Silvia A., to Dow Chemical Company, The. Thermoplastic blend of polycarbonate, polymethylmethacrylate and AES. 4,880,554, Cl. 525-67.000.

NewTech Products, Inc.: *See*—
Meinershagen, Charles I., 4,880,038, Cl. 140-93.600.

NGK Spark Plug Co., Ltd.: *See*—
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Nguyen, Dam C.: *See*—
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NHK Spring Co., Ltd.: *See*—
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Nicastro, Antonio: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.

Nicholas, Vincent; and Siwinski, Paul P., to AMP Incorporated. Method and apparatus for terminating ribbon cables. 4,879,809, Cl. 29-860.000.

Nicotra, Mario: *See*—
Monterosso, Gianpaolo; Marazzi, Riccardo; Nicotra, Mario; and Manenti, Luciano, 4,881,071, Cl. 340-870.130.

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Niedermayr, Erich; and Griessbach, Robert, to Siemens Aktiengesellschaft. Non-contacting measuring system for precision characteristics, particularly of industrial robots. 4,880,992, Cl. 250-561.000.

Nierman, David M. Biopsy forceps. 4,880,015, Cl. 128-751.000.

Niese, Lynn: *See*—
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Nieusma, Dick H., Jr. Barriers for dental and medical handpiece hangers. 4,880,381, Cl. 433-28.000.

Niggemann, Richard E.; and Nguyen, Dam C., to Sundstrand Corporation. Impingement plate type heat exchanger. 4,880,055, Cl. 165-167.000.

Nihon Medi-Physics Co., Ltd: *See*—
Azuma, Makoto; Takahashi, Jun; Yamauchi, Hirohiko; and Ueda, Nobuo, 4,880,616, Cl. 424-1.100.

Nihon Parkerizing Co., Ltd.: *See*—
Matsuda, Shigeki; Mori, Kazuhiko; Gotou, Wataru; and Ohnuki, Takahiro, 4,880,476, Cl. 148-253.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
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Nii, Kenichi: *See*—
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Niimi, Hiroshi: *See*—
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Nino, Masayuki: *See*—
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Ninomiya, Kunihiro; Saito, Ken-Ichi; Morita, Shuji; Tobe, Akihiro; and Nitta, Issei, to Mitsubishi Kasei Corporation. 4-aminopyridine derivatives for improving impaired brain function. 4,880,819, Cl. 514-316.000.

Nippon Cable System Inc.: *See*—
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Nippon Colin Co., Ltd.: *See*—
Jaeb, Jonathan P.; Gilstad, Dennis W.; and Branstetter, Ronald L., 4,880,304, Cl. 356-41.000.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Kondo, Susumu; Moriya, Tetsuo; and Aoyama, Hiroshi, 4,880,886, Cl. 526-80.000.
Nippon Selen Co., Ltd.: *See*—
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Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,880,857, Cl. 523-205.000.
Nippon Soda Co., Ltd.: *See*—
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Nippon Steel Corporation: *See*—
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Nippondenso Co., Ltd.: *See*—
Kato, Yoji; Minai, Osamu; Tukamoto, Hirosi; Hagiwara, Takashi; and Kosaka, Katsuji, 4,881,018, Cl. 318-9.000.
Makino, Nobuhiko; Tamura, Kimio; Miyazaki, Hiroharu; Hosoda, Tomohiko; and Nakagawa, Fumio, 4,880,282, Cl. 303-116.000.
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Nishi, Kenji, to Nikon Corporation. Optical device for alignment in a projection exposure apparatus. 4,880,310, Cl. 356-401.000.
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Nishigaki, Shinichi; Nakamura, Takeaki; Yoshinaga, Jun; Kanno, Masahide; Yabe, Hisao; Yokoi, Takeshi; Oozeki, Kazuhiko; Tojo, Yoshikazu; and Suzuki, Hiromasa, to Olympus Optical Co., Ltd. Rigid electronic endoscope. 4,879,992, Cl. 128-6.000.
Nishijima, Masaru; and Soga, Akihiro, to Sharp Kabushiki Kaisha. Copier with variable magnification ratio. 4,881,102, Cl. 355-243.000.
Nishikawa, Hiroaki: *See*—
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Nishikawa, Kohei: *See*—
Sugihara, Hirosada; Itoh, Katsumi; and Nishikawa, Kohei, 4,880,809, Cl. 514-255.000.
Nishimura, Yuji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Driving force transmitting structure for automatic seat belt apparatus. 4,880,253, Cl. 280-804.000.
Nishimura, Yukinobu: *See*—
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,879,983, Cl. 123-339.000.
Nishino, Tsutomu, to Canon Kabushiki Kaisha. Information processor having cursor display system and control. 4,881,064, Cl. 340-709.000.
Nishio, Koichi: *See*—
Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, 4,880,986, Cl. 250-484.100.
Nishio, Shintaro: *See*—
Ohno, Kiyotaka; Takahashi, Toshiya; and Nishio, Shintaro, 4,880,939, Cl. 549-458.000.
Nishioka, Jim Z. Shooting bow. 4,879,987, Cl. 124-25.000.
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Fine adjustment mechanism for a scanning tunneling microscope. 4,880,975, Cl. 250-306.000.
Nishiyama, Masaaki, to Minolta Camera Kabushiki Kaisha. Character image generating circuit. 4,881,180, Cl. 364-518.000.
Nishiyama, Toyoo: *See*—
Imade, Shinichi; Shionoya, Kazunori; Ikuta, Eishi; Taguchi, Koji; Nishiyama, Toyoo; Wakamatsu, Seiichi; and Nagasaki, Tatsuo, 4,880,011, Cl. 128-662.060.
Nissan Motor Co., Ltd.: *See*—
Endo, Motonori; and Minakami, Hiroshi, 4,880,307, Cl. 356-375.000.
Matsumoto, Eiichi, 4,879,981, Cl. 123-198.00C.
Matsushita, Tsutomu, 4,881,107, Cl. 357-23.400.
Matsushita, Tsutomu, 4,881,112, Cl. 357-47.000.
Shiraishi, Yasuhiro; and Nagamine, Yoshinori, 4,881,019, Cl. 318-68.000.
Nitsch, Alfred: *See*—
Engel, Gunter; Krempl, Peter W.; List, Helmut; Posch, Uwe; and Nitsch, Alfred, 4,881,003, Cl. 310-311.000.
Nitta, Issei: *See*—
Ninomiya, Kunihiro; Saito, Ken-Ichi; Morita, Shuji; Tobe, Akihiro; and Nitta, Issei, 4,880,819, Cl. 514-316.000.
Nitta, Tsuneo; Uehara, Kensuke; and Watanabe, Sadakazu, to Kabushiki Kaisha Toshiba. Speech recognition system. 4,881,266, Cl. 381-43.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Higashi, Kazumi; and Noda, Yuzuru, 4,880,895, Cl. 528-173.000.
Horiuchi, Tetsuo; and Inoue, Yuichi, 4,880,416, Cl. 604-307.000.
Nitto Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamada, Hideaki; Enomoto, Kanehiko; and Watanabe, Ichiro, 4,880,739, Cl. 435-129.000.
Nitzinger, Karl; Gerl, Josef; Steiner, Herbert; and Hess, Helmut, to Bosch-Siemens Hausgerate GmbH. Baking oven having a lighting device with a low voltage and/or halogen bulb. 4,880,955, Cl. 219-10.55R.
Niwayama, Kazuhiko; Nakagawa, Tsutomu; Tokunoh, Futoshi; and Yoshida, Shigekazu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,881,118, Cl. 357-79.000.
NKK Corporation: *See*—
Uesugi, Mitsuaki; Inomata, Masaichi; and Komine, Isamu, 4,881,126, Cl. 358-160.000.
Noack, Timothy J.: *See*—
Schwendemann, Kenneth L.; and Noack, Timothy J., 4,880,060, Cl. 166-336.000.
Nobelpharma AB: *See*—
Albrektsson, Tomas; and Aspenberg, Per, 4,880,006, Cl. 128-630.000.
Noble, Robert L.: *See*—
Glassco, Robert B.; and Noble, Robert L., 4,879,850, Cl. 52-82.000.
Noda, Etsuo: *See*—
Inoue, Kazuo; Kubota, Osamu; Yano, Shunji; Tateishi, Fusao; Noda, Etsuo; Yamaguchi, Koji; and Endo, Tsuneo, 4,880,351, Cl. 415-164.000.
Noda, Yuzuru: *See*—
Higashi, Kazumi; and Noda, Yuzuru, 4,880,895, Cl. 528-173.000.
Nolf, Jean-Marie E.; Vansant, Jan L. M. F. G.; and Jensen, Michael L., to Raychem Corporation. Electrical device. 4,880,962, Cl. 219-549.000.
Nolte, Bert; and Leonhardt, Siegfried, to Otto Ficker AG. Process for automatically packaging letter envelopes and mailing wallets into a container and automatic packaging machine for carrying out the process. 4,879,862, Cl. 53-438.000.
Nonini, Geremia: *See*—
Duri' , Antonino; and Nonini, Geremia, 4,879,893, Cl. 72-402.000.
Noordermeer, Michael N. A. One-piece high-solids nebulizer. 4,880,164, Cl. 239-423.000.
Norberg, Astrid: *See*—
Winblad, Bengt; and Norberg, Astrid, 4,880,409, Cl. 604-73.000.
Nordson Corporation: *See*—
Shimada, Takaji, 4,880,663, Cl. 427-96.000.
Norian Corporation: *See*—
Constantz, Brent R., 4,880,610, Cl. 423-305.000.
Norling, Brian L., to Sundstrand Data Control, Inc. Unitary push-pull force transducer. 4,879,914, Cl. 73-862.590.
Norris, Harold G., Jr. Method for converting a digging boom to a lifting boom. 4,880,123, Cl. 212-177.000.
Northern Telecom Limited: *See*—
Woodward, Daniel A., 4,880,349, Cl. 414-786.000.
Nova Sensor: *See*—
Ramsey, Jeffery E.; Bryzek, Janusz; and Mallon, Joseph R., Jr., 4,879,903, Cl. 73-431.000.
Novak, Donald S.: *See*—
Bennett, John E.; Novak, Donald S.; and Mitchell, Thomas A., 4,880,517, Cl. 204-196.000.
Novak, John W.: *See*—
Khosah, Robinson P.; Novak, John W.; Weaver, Douglas G.; Fraser-Milla, Karen R.; and Burr, Richard R., 4,880,543, Cl. 210-635.000.
Novak, Tibor, to Innofinance Altalanos Innovacios Penzintezet. Skin care compositions having keratolytic and antiinflammatory activity. 4,880,630, Cl. 424-195.100.
Nowak, Gerhard; Kruschik, Klaus; Morbitzer, Hans P.; Theuer, Rudolf; and Winter, Alfred, to TMC Corporation. Ski safety binding. 4,880,252, Cl. 280-618.000.
Nozaki, Kenzie: *See*—
Van Broekhoven, Johannes A. M.; Drent, Eit; Klei, Ebel; and Nozaki, Kenzie, 4,880,903, Cl. 528-392.000.
Nunes, Francisco M. D. S. Machine tool. 4,879,845, Cl. 51-98.500.
NV Medicopharma: *See*—
Rossmark, Rene T. M., 4,880,410, Cl. 604-110.000.
O-I Brockway Glass, Inc.: *See*—
Beningo, Joseph A., 4,880,454, Cl. 65-24.000.
Obayashi, Shigeji; Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; and Sakamoto, Yuji, to Seitetsu Kagaku Co., Ltd. Process for producing a water-absorbent resin. 4,880,888, Cl. 526-209.000.
Obermeier, Manfred; and Herrmann, Erhard, to Kabelmetal Electro GmbH. Method for manufacturing and marking cable. 4,880,484, Cl. 156-51.000.
O'Connor, Gerald J., to UnitedTechnologies Corporation. Method of balancing rotors. 4,879,792, Cl. 29-156.40R.
O'Dowd, James G.; Catalano, Anthony W.; Fortmann, Charles M.; and Lee, Ora J., to Solarex Corporation. Method of depositing textured tin oxide. 4,880,664, Cl. 427-109.000.
Office National D'Etudes et de Recherches Aerospatiales: *See*—
Vuillet, Alain E.; Philippe, Jean J.; and Desopper, Andre , 4,880,355, Cl. 416-228.000.
Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, to Yamanouchi Pharmaceutical Co., Ltd. Injection of nicardinpine

hydrochloride and process for the production thereof. 4,880,823, Cl. 514-356.000.

Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Sensor using a field effect transistor and method of fabricating the same. 4,881,109, Cl. 357-25.000.

Ogawa, Kiyoshi: *See*—
Suzuki, Tsutomu; Seko, Tatsushi; Tobita, Kuniharu; Matsubayashi, Saburo; Kougo, Nobuhiko; Ogawa, Kiyoshi; Taniguchi, Susumu; Minami, Masaharu; Hayakawa, Masayuki; and Kawada, Noriyuki, 4,879,788, Cl. 26-94.000.

Ogawa, Takuji: *See*—
Shiraishi, Kazuhisa; Nakagoshi, Kazuo; and Ogawa, Takuji, 4,881,136, Cl. 360-25.000.

Ogawa, Tomoya: *See*—
Fujita, Shuji; Yoshimura, Shoji; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, 4,880,572, Cl. 260-404.000.

Ogawa, Yukio: *See*—
Morimoto, Kiyoshi; Watanabe, Hiroshi; Itoh, Shigeo; Ogawa, Yukio; and Uzawa, Satoshi, 4,881,005, Cl. 313-422.000.

Ogihara, Masuo; Ishida, Hiroyuki; Nagaoka, Shinji; Seki, Youichi; Tagami, Shigeru; Yamazaki, Hiroshi; and Shinozaki, Nobuo, to Seikosha Co., Ltd. Motor-driven shutter for camera. 4,881,096, Cl. 354-400.000.

Ogiu, Hisao, to Olympus Optical Co., Ltd. Endoscope. 4,879,991, Cl. 128-6.000.

Ogura, Mitsugi: *See*—
Momodomi, Masaki; Ogura, Mitsugi; and Kumanomido, Takaki, 4,881,113, Cl. 357-51.000.

Ohara, Sosaburo; Ikeda, Atsushi; Shinohara, Seigo; and Kijima, Tetsuo, to Taiho Industries Co., Ltd. Spray Lustering-cleansing agent. 4,880,557, Cl. 252-174.150.

Ohashi, Hiromichi: *See*—
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,881,120, Cl. 357-23.400.

Ohashi, Kazuo, to Kabushiki Kaisha Patine Shokai. Piping apparatus for melting snow and ice. 4,880,051, Cl. 165-45.000.

Ohba, Hisao: *See*—
Toyama, Tadao; Ohba, Hisao; and Kunichika, Kenji, 4,880,724, Cl. 430-302.000.

Ohi Seisakusho Co., Ltd.: *See*—
Yamazaki, Hiroshi; Hara, Toshiyuki; Tanaka, Yuji; and Mouri, Takayuki, 4,880,264, Cl. 292-226.000.

Ohki, Hiroshi, to Sony Corporation. Method of making optically recorded information medium by exposure to ultraviolet light. 4,881,217, Cl. 369-132.000.

Ohkumo, Hiroya, to Fuji Jukogyo Kabushiki Kaisha. Control system for a clutch for a vehicle. 4,880,094, Cl. 192-0.052.

Ohnishi, Hiroshi: *See*—
Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Ohnishi, Hiroshi, 4,880,142, Cl. 222-56.000.

Ohno, Kiyotaka; Takahashi, Toshiya; and Nishio, Shintaro, to Toray Industries. 2,5,6,7-tetranor-18,18,19,19-tetradehydro-4,8-inter-m-phenylene PGI_2 derivatives. 4,880,939, Cl. 549-458.000.

Ohnuki, Takahiro: *See*—
Matsuda, Shigeki; Mori, Kazuhiko; Gotou, Wataru; and Ohnuki, Takahiro, 4,880,476, Cl. 148-253.000.

Ohsumi, Katsumi: *See*—
Matsuda, Masami; Funabashi, Kiyomi; Nishi, Takashi; Komori, Itaru; Baba, Tsutomu; Yusa, Hideo; Uchida, Shunsuke; Adachi, Tetsuro; Ohsumi, Katsumi; and Sato, Tomohiro, 4,880,595, Cl. 376-313.000.

Ohta, Hisatoshi: *See*—
Kito, Shozo; Harada, Shoichi; Imai, Hajime; Ohta, Hisatoshi; Suzuki, Masamitsu; and Muramatsu, Tadao, 4,880,092, Cl. 192-4.00A.

Ohta, Kazuhiro: *See*—
Ikeda, Hayato; Ohta, Kazuhiro; and Kawamura, Hisato, 4,880,361, Cl. 417-269.000.

Ohta, Kenji: *See*—
Deguchi, Toshihisa; Fujii, Yoshikazu; Inui, Tetsuya; Ohta, Kenji; and Katoh, Schohichi, 4,881,216, Cl. 369-54.000.

Ohta, Masaki: *See*—
Suzuki, Shinichi; Hibino, Soukichi; Hamaoka, Takahiro; and Ohta, Masaki, 4,880,356, Cl. 417-53.000.

Ohtani, Go: *See*—
Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, 4,880,823, Cl. 514-356.000.

Ohtani, Takayuki: *See*—
Tsujimoto, Jun-ichi; Matsui, Masataka; Iwai, Hiroshi; and Ohtani, Takayuki, 4,881,202, Cl. 365-200.000.

Ohtoshi, Tsukuru: *See*—
Chinone, Naoki; Uomi, Kazuhisa; Fukuzawa, Tadashi; Matsueda, Hideaki; Kajimura, Takashi; and Ohtoshi, Tsukuru, 4,881,235, Cl. 372-45.000.

Ohuchi, Renzo: *See*—
Tamoto, Katsumi; Ohuchi, Renzo; and Ono, Keiichi, 4,880,827, Cl. 514-423.000.

Ohya, Takeji, to Mazda Motor Corporation. Back door structure for a motor vehicle. 4,880,267, Cl. 296-56.000.

Ohya, Yasuhiro: *See*—
Murofushi, Toshiaki; Nakazawa, Hiroshi; Oyamada, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; and Ohya, Yasuhiro, 4,880,719, Cl. 430-106.600.

Ohyama, Masao: *See*—
Meguro, Hiroshi; Yamamoto, Yoshinori; Ohyama, Masao; Horikawa, Kenichi; Mizusawa, Shigeru; and Kawakami, Kenji, 4,881,137, Cl. 360-96.500.

Oka, Joji: *See*—
Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, 4,880,890, Cl. 528-45.000.
Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, 4,880,891, Cl. 528-45.000.

Okada, Kazuo: *See*—
Tadokoro, Michihiro; Imai, Hitoshi; and Okada, Kazuo, 4,881,204, Cl. 369-46.000.

Okada, Minoru. Process for preparing simulated meat. 4,880,654, Cl. 426-574.000.

Okada, Toshihiko; Yagi, Toshifumi; and Suzuki, Satoshi, to Gunze Limited. Circular knitting machine. 4,879,886, Cl. 66-151.000.

Okamizu, Shigeo: *See*—
Sakamoto, Shunji; Okamizu, Shigeo; Ota, Yuji; and Katsuki, Hisaaki, 4,880,072, Cl. 180-140.000.

Okamoto, Takeshi; Iwata, Mitsuo; and Takahashi, Hiroaki, to Terumo Kabushiki Kaisha. Dialytic solution for peritoneal dialysis. 4,880,629, Cl. 424-678.000.

Okamoto, Tetsuhiko: *See*—
Ueyama, Shinichiro; Yoshikawa, Yasuhiro; and Okamoto, Tetsuhiko, 4,880,905, Cl. 528-399.000.

Okamura, Katsutoshi; Esaki, Yasuo; Matsuzawa, Koichi; and Asano, Katsuhiko, to Fuji-Davison Chemical, Ltd.; and Kirin Brewery Company Limited. Method for stabilization treatment of beer with hydrated silica gel. 4,880,650, Cl. 426-330.400.

Okita, Kumakazu; Abe, Toshiaki; and Kiriyama, Masaru, to Daito Communication Apparatus Co., Ltd. Process for producing self-restoring over-current protective device by grafting method. 4,880,577, Cl. 264-22.000.

Okita, Tsutomu: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Hashimoto, Akihiro; Okita, Tsutomu; and Hanai, Kazuko, 4,880,692, Cl. 428-323.000.
Ryoke, Katsumi; Takahashi, Masatoshi; Hashimoto, Akihiro; Okita, Tsutomu; and Yoneyama, Takashi, 4,880,693, Cl. 428-323.000.

Okochi, Sadao, to Kabushiki Kaisha Toshiba. Stabilized electric power apparatus for generating direct and alternating current simultaneously in one transformer. 4,881,014, Cl. 315-246.000.

Okochi, Toshio: *See*—
Sasaki, Hisao; Terada, Matsuaki; Matsui, Susumu; Kawakita, Kenji; Kashio, Jiro; Baba, Shiro; Akao, Yasushi; and Okochi, Toshio, 4,881,167, Cl. 364-200.000.

Okuda, Haruo: *See*—
Sakamoto, Masashi; Okuda, Haruo; Takahashi, Hideo; and Yamada, Eiji, 4,880,703, Cl. 428-378.000.

Okuzawa, Yoshiko: *See*—
Yamahira, Yoshiya; Okuzawa, Yoshiko; Fujioka, Keiji; Sato, Shigeji; and Ishikawa, Reimei, 4,880,796, Cl. 514-206.000.

Oldani, Jerome L.: *See*—
Hollewed, Edward J.; Goeken, John D.; and Oldani, Jerome L., 4,881,254, Cl. 379-144.000.

Oliphant, Jean R.; Workman, Harold W.; and Shah, Jasvantrai C., to Rockwell International Corporation. Method for predictive pacing of calls in a calling system. 4,881,261, Cl. 379-215.000.

Oliveira, Robert J.: *See*—
Ahlberg, Carl S.; Chamberlin, Davis W.; Bushong, Jerold W.; Oliveira, Robert J.; and Kolpe, Vasant V., 4,880,076, Cl. 181-130.000.

Olson, Robert N., to Ampex Corporation. Low profile tilt lock mechanism with pivotable locking link to engage cam surface. 4,879,786, Cl. 16-341.000.

Olympus Optical Co., Ltd.: *See*—
Imade, Shinichi; Shionoya, Kazunori; Ikuta, Eishi; Taguchi, Koji; Nishiyama, Toyoo; Wakamatsu, Seiichi; and Nagasaki, Tatsuo, 4,880,011, Cl. 128-662.060.
Nishigaki, Shinichi; Nakamura, Takeaki; Yoshinaga, Jun; Kanno, Masahide; Yabe, Hisao; Yokoi, Takeshi; Oozeki, Kazuhiko; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,879,992, Cl. 128-6.000.
Ogiu, Hisao, 4,879,991, Cl. 128-6.000.
Takada, Katsuhiro, 4,880,298, Cl. 350-414.000.
Yanagawa, Yutaka, 4,880,009, Cl. 128-660.090.

Omata, Satoshi: *See*—
Kanno, Hideo; Yamashita, Shinichi; Omata, Satoshi; Enari, Masahiko; Kuno, Mitsutoshi; and Osada, Yoshiyuki, 4,881,066, Cl. 340-719.000.

Omni Films International, Inc.: *See*—
Hollingsworth, Fred, III; and Angus, Julian G., 4,879,849, Cl. 52-10.000.

Omron Tateisi Electronics Company: *See*—
Nakamura, Hideaki; Shimamori, Tamotsu; and Murashige, Shinichi, 4,881,039, Cl. 328-26.000.
Sato, Shohei, 4,880,012, Cl. 128-663.010.
Shima, Koichi; and Tomizu, Motoyuki, 4,880,401, Cl. 439-746.000.
Tanaka, Takashi; Sano, Takezo; and Shimizu, Tsutomu, 4,881,053, Cl. 335-80.000.

Omura, Takashi: *See*—
Harada, Naoki; Miyamoto, Tetsuya; Imada, Kunihiko; and Omura, Takashi, 4,880,434, Cl. 8-549.000.
Yokogawa, Kazufumi; Harada, Naoki; and Omura, Takashi, 4,880,431, Cl. 8-549.000.

Ono, Keiichi: *See*—
Tamoto, Katsumi; Ohuchi, Renzo; and Ono, Keiichi, 4,880,827, Cl. 514-423.000.

Onuki, Kazuhiko; and Maetani, Masami, to Canon Kabushiki Kaisha. Reader printer and image recording apparatus. 4,881,099, Cl. 355-45.000.

Oozeki, Kazuhiko: *See—*
Nishigaki, Shinichi; Nakamura, Takeaki; Yoshinaga, Jun; Kanno, Masahide; Yabe, Hisao; Yokoi, Takeshi; Oozeki, Kazuhiko; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,879,992, Cl. 128-6.000.

Oppermann, Gunter: *See—*
Hartel, Volker; Theisen, Dieter; and Oppermann, Gunter, 4,880,216, Cl. 267-140.100.

Orbital Sarl: *See—*
Mazoyer, Pierre, 4,880,956, Cl. 219-60.00A.

Orizio Paolo S.p.A.: *See—*
Bertagnoli, Leopoldo, 4,879,884, Cl. 66-14.000.

Orth, Robert A.: *See—*
Booth, Rodney I.; Edwards, David W.; Wrigley, Colin W.; and Orth, Robert A., 4,879,897, Cl. 73-59.000.

Ortho Pharmaceutical Corporation: *See—*
Kanojia, Ramesh M.; Lever, O. William, Jr.; and Press, Jeffery B., 4,880,817, Cl. 514-309.000.
Press, Jeffery B.; and Urbanski, Maud, 4,880,824, Cl. 514-368.000.

Osada, Yoshiyuki: *See—*
Kanno, Hideo; Yamashita, Shinichi; Omata, Satoshi; Enari, Masahiko; Kuno, Mitsutoshi; and Osada, Yoshiyuki, 4,881,066, Cl. 340-719.000.

Osburn, Coy D.; and Sullivan, James B., to TDW Delaware, Inc. Completion machine. 4,880,028, Cl. 137-315.000.

Osinski, Marek A.: *See—*
Brueck, Steven R. J.; Schaus, Christian F.; Osinski, Marek A.; McInerney, John G.; Raja, M. Yasin A.; Brennan, Thomas M.; and Hammons, Burrell E., 4,881,236, Cl. 372-45.000.

Osterwalder, Robert U.: *See—*
Comninellis, Christos; Osterwalder, Robert U.; Plattner, Eric; and Seifert, Gottfried, 4,880,571, Cl. 552-297.000.

Ota, Yuji: *See—*
Sakamoto, Shunji; Okamizu, Shigeo; Ota, Yuji; and Katsuki, Hisaaki, 4,880,072, Cl. 180-140.000.

Otojima, Hirao: *See—*
Matsui, Isamu; Uchida, Hiroshi; Otojima, Hirao; and Kino, Yoshihiro, 4,880,176, Cl. 242-35.60E.

Otsubo, Kazunari; Ezoe, Motonobu; Ago, Hideo; and Yamamoto, Koji, to Idemitsu Petrochemical Co., Ltd. Polycarbonate for disc substrate having low bisphenol content. 4,880,896, Cl. 528-196.000.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Uchida, Minoru; Morita, Seiji; Chihiro, Masatoshi; and Nakagawa, Kazuyuki, 4,880,815, Cl. 514-303.000.
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,880,806, Cl. 514-249.000.

Otsuka, Tatsuya: *See—*
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,880,806, Cl. 514-249.000.

Otto Ficker AG: *See—*
Nolte, Bert; and Leonhardt, Siegfried, 4,879,862, Cl. 53-438.000.

Otvos, Laszlo : *See—*
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.

Outboard Marine Corporation: *See—*
Friedle, Dennis J.; Kolb, Richard P.; and McLeod, Kenneth M., 4,880,403, Cl. 440-88.000.
Lathers, Michael W., 4,879,962, Cl. 114-188.000.
VanRens, Russell J., 4,880,047, Cl. 164-45.000.

Ovren, Christer: *See—*
Brogardh, Torgny; and Ovren, Christer, 4,880,972, Cl. 250-231.00R.

Owens-Illinois Plastic Products Inc.: *See—*
Kaminski, Ronald S., 4,880,369, Cl. 425-116.000.

Oxman, Joel D.: *See—*
Aasen, Steven M.; and Oxman, Joel D., 4,880,660, Cl. 427-2.000.

Oyamada, Koichi: *See—*
Murofushi, Toshiaki; Nakazawa, Hiroshi; Oyamada, Koichi; Aonuma, Shigeo; Amagai, Yoshimi; and Ohya, Yasuhiro, 4,880,719, Cl. 430-106.600.

Oyamada, Takashi, to NEC Corporation. Housing and holder assembly for a portable communication apparatus. 4,881,150, Cl. 361-392.000.

Ozaki, Kunimitsu: *See—*
Bennett, Robert P.; and Ozaki, Kunimitsu, 4,880,954, Cl. 219-10.55M.

Ozawa, Toshiaki: *See—*
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,880,325, Cl. 400-249.000.

Ozawa, Yasuhiro: *See—*
Taki, Naohiro; and Ozawa, Yasuhiro, 4,880,340, Cl. 408-176.000.

P. L. Porter Company: *See—*
Tanaka, Akira; and Lee, Jimmy C.-M., 4,880,084, Cl. 188-67.000.

Packaging Corporation of America: *See—*
Stone, James L., 4,880,155, Cl. 229-125.090.

Packer, Julian P.; and Almozaffar, Sam, to Combined Power Systems Limited. Building heat and power system. 4,880,993, Cl. 290-2.000.

Pahl, Scott T., to USI Lighting, Inc. Adjustable light fixture. 4,881,157, Cl. 362-371.000.

Pailler, Rene : *See—*
Remondiere, Olivier; Bourquin, Patrick; and Pailler, Rene , 4,880,960, Cl. 219-273.000.

Paillet, Michel: *See—*
Chanzy, Henri D.; and Paillet, Michel, 4,880,469, Cl. 106-203.000.

Pall Corporation: *See—*
Haraveth, Garry R.; Catterfeld, Robert J.; and Trasen, Benjamin, 4,880,536, Cl. 210-232.000.
Pall, David B.; and Gsell, Thomas C., 4,880,548, Cl. 210-767.000.

Pall, David B.; and Gsell, Thomas C., to Pall Corporation. Device and method for separating leucocytes from platelet concentrate. 4,880,548, Cl. 210-767.000.

Palmateer, Paul H.: *See—*
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.

Palotas, Laszlo ; Laszlo, Geza; Horvath, Lazlo; Baria, Arpadne ; Marion, Barnabas; and Szarka, Ferencne , to Taurus Gumiipari Vallalat. Two-piece valve system for bodies to be filled with a gaseous medium, liquid, in particular for products of the rubber industry. 4,880,208, Cl. 251-356.000.

Pals, Donald T.: *See—*
Hester, Jackson B., Jr.; Thaisrivongs, Suvit; Sawyer, Tomi K.; TenBrink, Ruth E.; Saneii, Hossain H.; Schostarez, Heinrich J.; and Pals, Donald T., 4,880,781, Cl. 514-18.000.

Pando, Basilio: *See—*
Sunkel, Carlos; Fay de Casa Juana, Miguel; Dorrego, Fernando; Pando, Basilio; Alvarez-Builla, Julio; Vaquero, Juan J.; Galera, Carlos; and Vazquez, Maria L., 4,880,894, Cl. 548-152.000.

Paneth, Eric: *See—*
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.

Panzica, Ignatius J.; and Hoeptner, Herbert W., to Custom Chrome, Inc. Motorcycle wheel hub and flange assembly. 4,880,280, Cl. 301-105.00B.

Papuchon, Michel: *See—*
Vatoux, Sylvie; Papuchon, Michel; and Lefevre, Herve , 4,880,288, Cl. 350-96.120.

Parapluie, Ltd.: *See—*
Ferre, F. Budd; Sims, Rowell; Bowen, Wesley G.; and Kesler, Vibert L., 4,880,026, Cl. 137-234.600.

Paraskevas, Elefterios, to Kiehmaschinen GmbH. Drawing machine for continuous drawing of endless wires or tubes. 4,879,892, Cl. 72-290.000.

Parent, Laurent R.: *See—*
Randall, Kenneth R., Jr.; and Parent, Laurent R., 4,880,168, Cl. 239-553.500.

Park, John J.; White, Paul W.; and Richardson, Calvin, to Formica Corporation. Damage resistant decorative laminate. 4,880,689, Cl. 428-143.000.

Park, Moo K., to Formulations Development Labs, Inc. Oral liquid pharmaceutical compositions of sulindac. 4,880,835, Cl. 514-570.000.

Parker Hannifin Corporation: *See—*
Ellison, John E., 4,880,205, Cl. 251-30.020.

Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., to Imperial Chemical Industries PLC. Ethers on esters of 1-triazole-2-substituted ethanols. 4,880,457, Cl. 71-92.000.

Passmore, Edmund M., to GTE Products Corporation. Electrode for high intensity discharge lamps. 4,881,009, Cl. 313-631.000.

Patarini, Leon: *See—*
Gallagher, Thomas A.; Knowlton, Paul; and Patarini, Leon, 4,880,131, Cl. 220-83.000.

Patel, Navinchandra R.; and Schwarz, Robert A., to Sundstrand Corporation. Stator laminate retainer assembly. 4,881,001, Cl. 310-258.000.

Patterson, Dwight; and Levine, Neil A., to Humonics, Inc. Soap film flowmeter. 4,879,907, Cl. 73-861.050.

Patterson, Jon M.; and Brown, Douglas P., to Deere & Company. Torsional link boom suspension for reducing unwanted boom motion. 4,880,160, Cl. 239-167.000.

Patton, Paul B.: *See—*
Bartels, James I.; Patton, Paul B.; Kidder, Kenneth B.; and Gaskell, Alfred J., 4,880,376, Cl. 431-12.000.

Patzschke, Hans-Peter: *See—*
Gobel, Armin; Graff, Knut; Meier, Hans-Ulrich; and Patzschke, Hans-Peter, 4,880,867, Cl. 524-507.000.

Patzwaldt, Wolfgang: *See—*
Auslander, Klaus; Fabris, Hans-Jurgen; Patzwaldt, Wolfgang; and Seichter, Helmut, 4,881,036, Cl. 324-329.000.

Paul, David S.: *See—*
Jensen, Svend; Paul, David S.; and Appleyard, Michael, 4,880,269, Cl. 296-190.000.

Paul, Winfried G.; Price, Ronald L.; and Krishnan, Sivaram, to Mobay Corporation. Thermoplastic polycarbonates and blends with enhanced flame retardant properties. 4,880,864, Cl. 524-404.000.

Paull, Jolanta: *See—*
Dowing, Richard; Paull, Jolanta; and Vince, David, 4,879,952, Cl. 102-331.000.

Pauzat, Vincent: *See—*
Jatteau, Michel R.; Lelong, Pierre H.; Pauzat, Vincent; and Plard, Christian, 4,881,171, Cl. 364-413.240.

Paxman, David H.; Slatter, John A. G.; and Coe, David J., to U.S. Philips Corp. Semiconductor devices. 4,881,119, Cl. 357-23.400.

Payner, Leonard E.; and Keener, Jimmy L. Vision saver for computer monitor. 4,880,300, Cl. 350-618.000.

Paz-Pujalt, Gustavo R.: *See*—
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 4,880,770, Cl. 505-1.000.
Peck, James V.; and Minaskanian, Gevork, to Nelson Research & Development Co. Novel compounds and use thereof in selective cyclization process. 4,880,924, Cl. 540-520.000.
Pederson, Larry R.; Chick, Lawrence A.; and Exarhos, Gregory J., to Battelle Memorial Institute. Preparation of thin ceramic films via an aqueous solution route. 4,880,772, Cl. 505-1.000.
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., to UOP. Dewaxing catalysts employing non-zeolitic molecular sieves. 4,880,760, Cl. 502-67.000.
Pentwater Wire Products, Inc.: *See*—
Petter, Jay C., 4,880,118, Cl. 206-513.000.
Perazzo, Luigi: *See*—
Martini, Francesco; Perazzo, Luigi; and Vietto, Paolo, 4,880,592, Cl. 264-514.000.
Peregrim, Theodore J., to Raytheon Company. Aperture radar. 4,881,079, Cl. 342-194.000.
Pereira, Mark L. Pick for stringed musical instruments. 4,879,940, Cl. 84-322.000.
Performance Industries, Inc.: *See*—
Boyesen, Eyvind, 4,879,976, Cl. 123-651.000.
Periso SA Elektro-Industrie: *See*—
Scherrer, Fernand, 4,880,448, Cl. 55-103.000.
Permea, Inc.: *See*—
Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handerman, Alan C.; Cruse, Clint A.; and Malon, Raymond F., 4,880,441, Cl. 55-16.000.
Perret, Michel: *See*—
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, 4,880,946, Cl. 200-148.00A.
Perrin, Jerry, to Union Carbide Corporation. Hollow fiber multimembrane cells and permeators. 4,880,440, Cl. 55-16.000.
Perttula, Jouko: *See*—
Kahkipuro, Matti; Makinen, Heimo; and Perttula, Jouko, 4,880,082, Cl. 187-134.000.
Perusse, Eugene T.; and Hammer, Eugene L., to Hughes Aircraft Company. Hybrid high speed voltage regulator with reduction of miller effect. 4,881,023, Cl. 323-266.000.
Peters, Dieter, to Hoechst Aktiengesellschaft. Hexaammineraluminum iodide monoammoniate and process for its preparation. 4,880,612, Cl. 423-413.000.
Peterson, David L.; and Peterson, Michael J., to Sport Floor Design, Inc. Resilient leveler and shock absorber for sport floor. 4,879,857, Cl. 52-403.000.
Peterson, David L.: *See*—
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 4,880,770, Cl. 505-1.000.
Peterson, Michael J.: *See*—
Peterson, David L.; and Peterson, Michael J., 4,879,857, Cl. 52-403.000.
Peterson, Miles L.: *See*—
Ghose, Sanjoy; Bronshvatch, Efim; and Peterson, Miles L., 4,881,140, Cl. 360-106.000.
Peterson, Phillip R.; Gavrielides, Athanasios; and Cardimona, David A., to United States of America, Air Force. Optical parametric amplifying variable spatial filter. 4,880,996, Cl. 307-425.000.
Petraitis, Kestutis F.; and Baldauf, Walter W., Jr., to Harshaw Chemical Company, The. Regeneration of copper etch bath. 4,880,495, Cl. 156-642.000.
Petre, John H., to Cleveland Clinic Foundation, The. Method for patient equipment transport and support system. 4,879,798, Cl. 29-434.000.
Petter, Jay C., to Pentwater Wire Products, Inc. Stabilizer for stackable and foldable wire containers. 4,880,118, Cl. 206-513.000.
Pettersson, Ola: *See*—
Hansen Kaad, Flemming; and Pettersson, Ola, 4,880,598, Cl. 419-1.000.
Pettit, Dean K.: *See*—
Ting, Albert C.; Willis, Timothy R.; Christ, F. Richard; Bacich, Steven R.; Pettit, Dean K.; Van Gent, Stanley L.; and Day, Jeffrey C., 4,880,426, Cl. 623-6.000.
Peyrot, Jan: *See*—
Day, Eric; Aubin, Jean Paul; and Peyrot, Jan, 4,879,985, Cl. 123-501.000.
Pfeiffer, Pierre; Cheval, Benoit; and Sigwalt, Paul, to Sotralentz S. A. Cover assembly for a drum composed of synthetic resin. 4,880,138, Cl. 220-320.000.
Pfister, Theodor: *See*—
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurrsen, Klaus, 4,880,932, Cl. 544-320.000.
Pfisterer, Helmut; Schutze, Wolfgang; and Wezel, Heinz, to Institut Dr. Friedrich Forster Pruferatebau GmbH. Eddy current method and apparatus for determining structural defects in a metal object without removing surface films or coatings. 4,881,031, Cl. 324-233.000.
Pfizer Inc.: *See*—
Davidow, Lance S.; and DeZeeuw, John R., 4,880,741, Cl. 435-172.300.
Lowe, John A., III, 4,880,810, Cl. 514-258.000.
Pfohl, Sigberg; Kroener, Michael; Hartmann, Heinrich; and Denzinger, Walter, to BASF Aktiengesellschaft. Preparation of water-soluble copolymers containing vinylamine units, and their use as wet strength agents and dry strength agents for paper. 4,880,497, Cl. 162-135.000.
Pharmacia Nu Tech: *See*—
Whipple, Gary R., 4,880,414, Cl. 604-283.000.
Philippe, Jean J.: *See*—
Vuillet, Alain E.; Philippe, Jean J.; and Desopper, Andre , 4,880,355, Cl. 416-228.000.
Phillips, Charles W.: *See*—
Moskowitz, David; and Phillips, Charles W., 4,880,600, Cl. 419-12.000.
Phillips, Martin D.: *See*—
Moake, Joel L.; Phillips, Martin D.; McIntire, Larry V.; and Hellums, Jesse D., 4,880,788, Cl. 514-150.000.
Phillips Petroleum Company: *See*—
Bonazza, Benedict R., 4,880,679, Cl. 428-57.000.
Cleary, James W., 4,880,901, Cl. 528-388.000.
Horton, Robert L.; and Lakey, George V., 4,880,607, Cl. 423-20.000.
Photo Engineering S.R.L.: *See*—
Signoretto, Roberto, 4,881,090, Cl. 354-105.000.
Piatt, Wilson T., Jr.: *See*—
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.
Piazzo, Diego, to Fiat Auto S.p.A. Cylinder head for internal combustion engines. 4,879,980, Cl. 123-193.00H.
Picker International, Inc.: *See*—
Denison, Kenneth S.; Holland, G. Neil; and DeMeester, Gordon D., 4,881,033, Cl. 324-309.000.
Dragmen, Kenneth J., Sr., 4,880,222, Cl. 269-322.000.
Pierce, Daniel H. Poppet valve spring retainer. 4,879,978, Cl. 123-90.670.
Piergiorgio, Rossi; and Massimo, Calanchi, to Eurand Italia S.p.A. Process for the preparation of solid nifedipine formulations of high bioavailability and with sustained effect, and formulations thus obtained. 4,880,623, Cl. 424-78.000.
Pierson, Raymond; and Whiteley, William. Liquid petroleum confinement system. 4,880,040, Cl. 141-5.000.
Piesch, Ernst: *See*—
Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, 4,880,986, Cl. 250-484.100.
Pikulik, Ivan I., to Pulp and Paper Research Institute of Canada. Method for measurement of the permeability to water. 4,880,499, Cl. 162-198.000.
Pileur, Charles: *See*—
Jumel, Bernard; and Pileur, Charles, 4,880,139, Cl. 220-337.000.
Pioneer Electronic Corporation: *See*—
Kawanabe, Yoshihiro; and Ida, Kazunaga, 4,881,041, Cl. 328-112.000.
Pipe, Adrian J.: *See*—
Kitchin, John; Cherry, Peter C.; Pipe, Adrian J.; Crame, Andrew J.; and Borthwick, Alan D., 4,880,801, Cl. 514-215.000.
Pirc, Douglas J.: *See*—
Dawson, Andrew J., Jr.; Farrar, John C.; Pirc, Douglas J.; and Taylor, Atalee S., 4,880,397, Cl. 439-620.000.
Piskorz, Jan: *See*—
Scott, Donald S.; and Piskorz, Jan, 4,880,473, Cl. 127-37.000.
Piskula, James. Floor clean-out assembly. 4,879,771, Cl. 4-191.000.
Pitera, Kenneth R.: *See*—
Lambropoulos, George; Pitera, Kenneth R.; and Hair, Robert A., 4,881,148, Cl. 361-172.000.
Pitschi, Franz-Xaver: *See*—
Spinner, Georg; Pitschi, Franz-Xaver; and Linnerbauer, Horst, 4,880,949, Cl. 200-501.000.
Pittard, Gerard T.: *See*—
McDonald, William J.; Wasson, Michael R.; Leitko, Curtis E.; Pittard, Gerard T.; and Maurer, William C., 4,880,065, Cl. 175-71.000.
Pitzele, Barnett S.: *See*—
Hansen, Donald W., Jr.; Pitzele, Barnett S.; Clare, Michael; and Hamilton, Robert W., 4,880,829, Cl. 514-445.000.
Planmoebel Eggersman GmbH & Co. KG: *See*—
Moll, Reiner; and Utz, Andreas, 4,879,955, Cl. 108-50.000.
Plard, Christian: *See*—
Jatteau, Michel R.; Lelong, Pierre H.; Pauzat, Vincent; and Plard, Christian, 4,881,171, Cl. 364-413.240.
Plasticon Patents, S.A.: *See*—
Strassheimer, Herbert, 4,880,593, Cl. 264-532.000.
Plastics Engineering Company: *See*—
Waitkus, Phillip A., 4,880,893, Cl. 528-129.000.
Plattner, Eric: *See*—
Comninellis, Christos; Osterwalder, Robert U.; Plattner, Eric; and Seifert, Gottfried, 4,880,571, Cl. 552-297.000.
Pless, Benjamin D.; and Sweeney, Michael B., to Intermedics, Inc. Pacemaker for detecting and terminating a tachycardia. 4,880,005, Cl. 128-419.0PG.
Poe, Charles M., Jr.: *See*—
Goodrich, Jeffrey A.; Poe, Charles M., Jr.; and Prsha, Jeffrey A., 4,880,966, Cl. 250-231.00R.
Pohl, Ludwig: *See*—
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 4,880,492, Cl. 156-610.000.

Polaroid Corporation: *See*—
Josephson, Donald G., 4,881,091, Cl. 354-132.000.

Polgar, Tibor, to Schrack Elektronik-Aktiengesellschaft. Relay drive for polarized relay. 4,881,054, Cl. 335-230.000.

Polkinghorne, John, to TRW Canada, Ltd. Air damper assembly for refrigerator/freezer. 4,879,878, Cl. 62-187.000.

POM Incorporated: *See*—
Speas, Gary W., 4,880,097, Cl. 194-239.000.

Pommier, Daniel; and Alard, Michel, to Centre National d'Etudes des Telecommunications; and Telediffusion de France. Method and installation for digital communication, particularly between and toward moving vehicles. 4,881,241, Cl. 375-38.000.

Pomparelli, Vincent, to McNeil-PPC, Inc. Multiple strand elastic means. 4,880,420, Cl. 604-385.100.

Poncet, Sabine: *See*—
Guesnet, Patrice; Kawamura, Tetsuchi; Savin, Gerard; Poncet, Sabine; and Castera, Charles, 4,880,552, Cl. 252-34.000.

Ponte, Gary W.: *See*—
Leininger, Ernest; Blum, Leonard; and Ponte, Gary W., 4,880,063, Cl. 169-37.000.

Poole, James E.; and Hartman, Marvis E., to PPG Industries, Inc. UV coatings containing chlorinated polyolefins, method of curing, and coated substrates therefrom. 4,880,849, Cl. 522-10.000.

Porta Systems Corp.: *See*—
Neuwirth, Helmuth; and Meyerhofer, Carl H., 4,881,255, Cl. 379-412.000.

Posch, Uwe: *See*—
Engel, Gunter; Krempl, Peter W.; List, Helmut; Posch, Uwe; and Nitsch, Alfred, 4,881,003, Cl. 310-311.000.

Pow, Edwin C.: *See*—
Stubbe, James S.; Chevalier, James L.; and Pow, Edwin C., 4,879,801, Cl. 29-455.100.

PPG Industries, Inc.: *See*—
Hayes, Deborah E.; Weissberg, Alan B.; Friedlander, Charles B.; and Ryan, Edward T., 4,880,668, Cl. 427-162.000.
Poole, James E.; and Hartman, Marvis E., 4,880,849, Cl. 522-10.000.
Welch, Cletus N., 4,880,667, Cl. 427-160.000.

Prabhu, Ashok N.; Hang, Kenneth W.; and Conlon, Edward J., to General Electric Company. Thick film copper conductor inks. 4,880,567, Cl. 252-512.000.

Pradovic, Joseph A., to Millis Transfer, Inc. Movable bulkhead. 4,880,342, Cl. 410-121.000.

Prais, Eugene R., to Kansai Special USA Corp. Thread trimmer system for in-line chain stitch sewing machine. 4,879,960, Cl. 112-291.000.

Prebeck, Alfreda J. S-shaped jointer tool with symmetric blade and handle. 4,879,780, Cl. 15-105.500.

Prescott Durrell & Company: *See*—
Derby, Leslie B., III, 4,880,404, Cl. 446-329 000.

Press, Jeffery B.; and Urbanski, Maud, to Ortho Pharmaceutical Corporation. Phenyl and benzoyl substituted imidazo-fused heterocyclic calcium channel blockers. 4,880,824, Cl. 514-368.000.

Press, Jeffery B.: *See*—
Kanojia, Ramesh M.; Lever, O. William, Jr.; and Press, Jeffery B., 4,880,817, Cl. 514-309.000.

Preuss, Ingo: *See*—
Fichlseder, Martin; and Preuss, Ingo, 4,880,587, Cl. 264-154.000.

Priam Corporation: *See*—
Hazebrouck, Henry B., 4,881,139, Cl. 360-105.000.

Priatko, Gordon J.; and Kaskey, Jeffrey A., to United States of America, Energy. Digitally programmable signal generator and method. 4,881,190, Cl. 364-718.000.

Price, Gail L.: *See*—
Zwarun, Andrew A.; and Price, Gail L., 4,880,466, Cl. 106-21.000.

Price, George T., III. Flashlight switch with spare bulb carrier. 4,881,158, Cl. 362-207.000.

Price, James O.; Stewart, Albert J.; and Hasselbrack, Sally A., to Heath Tecna Aerospace, Co. Low heat output composite. 4,880,681, Cl. 428-116.000.

Price, Ronald L.: *See*—
Paul, Winfried G.; Price, Ronald L.; and Krishnan, Sivaram, 4,880,864, Cl. 524-404.000.

Priest, Christopher C. A.: *See*—
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.

Primat, Didier: *See*—
Billiotte, Jean-Marie; Bouin, Thierry; Basset, Frederic; Beauvois, Jacques; and Primat, Didier, 4,881,269, Cl. 382-8.000.

Prince Tsushinkogyo Limited: *See*—
Hirano, Taichi, 4,879,937, Cl. 84-699.000.

Prism Technologies, Inc.: *See*—
Manker, Charles F., 4,880,953, Cl. 219-10.55M.

Procter & Gamble Company, The: *See*—
Guffey, Timothy B.; Abe, Susan S.; Talkington, Sherry R.; and Mijac, Marko D., 4,880,657, Cl. 426-601.000.

Proctor, Don R. Computer analytical program process. 4,881,189, Cl. 364-715.050.

Progressive Health & Fitness: *See*—
Broussard, Robert, 4,880,229, Cl. 272-123.000.

Promed Technology, Inc.: *See*—
Weinberg, Wolfram S., 4,880,001, Cl. 128-303.100.

Prosser, Havard J.: *See*—
Allen, William M.; Sansom, Bernard F.; Wilson, Alan D.; Prosser, Havard J.; and Groffman, David M., 4,880,628, Cl. 424-605.000.

Protoned B.V.: *See*—
Brauning, Egon, 4,880,272, Cl. 297-296.000.

Prsha, Jeffrey A.: *See*—
Goodrich, Jeffrey A.; Poe, Charles M., Jr.; and Prsha, Jeffrey A., 4,880,966, Cl. 250-231.00R.

Pruyne, Lori S.: *See*—
Kopatz, Nelson E.; Stermer, Philip E.; and Pruyne, Lori S., 4,880,605, Cl. 422-232.000.

Puhler, Alfred: *See*—
Wohlleben, Wolfgang; Schulte, Agnes; and Puhler, Alfred, 4,880,746, Cl. 435-253.500.

Puigcerver, Luis; Shimirak, Gerald; and Berth, Jorgen, to Raychem Corporation. Cable sealing apparatus. 4,880,676, Cl. 428-35.700.

Pulp and Paper Research Institute of Canada: *See*—
Pikulik, Ivan I., 4,880,499, Cl. 162-198.000.

Pundsack, Arnold L.: *See*—
Tam, Man C.; Gundlach, Robert W.; and Pundsack, Arnold L., 4,880,715, Cl. 430-41.000.

Put, Berend: *See*—
Allen, John V.; Put, Berend; and Boraston, Geoff W., 4,879,958, Cl. 110-245.000.

Puvogel, Klaus: *See*—
Hoffmeister, Hermann; Puvogel, Klaus; and Schniederjan, Reinhold, 4,880,359, Cl. 417-216.000.

Quaker Oats Company, The: *See*—
Roy, David C.; and Roy, Marjorie E. C., 4,879,989, Cl. 124-79.000.
Wsyzynski, Randall, 4,880,197, Cl. 248-324.000.

Quantex Corporation: *See*—
Lindmayer, Joseph, 4,880,475, Cl. 427-69.000.

Quick, Freddie W. Trawl door. 4,879,830, Cl. 43-9.700.

Quick, Harry C.: *See*—
Milliser, Charles E.; Karalevicz, John M.; and Quick, Harry C., 4,880,323, Cl. 400-196.100.

R. J. Reynolds Tobacco Company: *See*—
Graves, William H., Jr.; Wallace, Gary W.; Bradford, Bruce P.; Carpenter, Carolyn R.; Smith, Kenneth W.; and Toft, Howard C., 4,880,018, Cl. 131-375.000.

R. Schmidt GmbH: *See*—
Muller, Olaf, 4,880,254, Cl. 280-808.000.

R. T. Vanderbilt Company, Inc.: *See*—
Doe, Lester A., 4,880,551, Cl. 252-47.500.
Karol, Thomas J., 4,880,437, Cl. 44-57.000.

Rabb, Randolph W. Aerial map navigational aid. 4,879,812, Cl. 33-1.0MP.

Rabo, Jule A.: *See*—
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., 4,880,760, Cl. 502-67.000.

Rademaker, Pieter D.: *See*—
Spanjer, Jacobs J.; and Rademaker, Pieter D., 4,880,582, Cl. 264-82.000.

Raja, M. Yasin A.: *See*—
Brueck, Steven R. J.; Schaus, Christian F.; Osinski, Marek A.; McInerney, John G.; Raja, M. Yasin A.; Brennan, Thomas M.; and Hammons, Burrell E., 4,881,236, Cl. 372-45.000.

Rajeswaran, Gopalan: *See*—
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 4,880,770, Cl. 505-1.000.

Rall, Ulrich: *See*—
Baehr, Bernd D.; Rall, Ulrich; van Delden, Hildegard; and Lillotte, Wolfgang, 4,880,566, Cl. 252-389.220.

Ramanujan, Raj K.: *See*—
Sager, David J.; Valiton, Anne S.; Stickney, Jay C.; and Ramanujan, Raj K., 4,881,165, Cl. 364-200.000.

Ramsey, Jeffery E.; Bryzek, Janusz; and Mallon, Joseph R., Jr., to Nova Sensor. Three part low cost sensor housing. 4,879,903, Cl. 73-431.000.

Ranco Incorporated: *See*—
Garcia, Richard R.; and Sites, Royal H., 4,881,057, Cl. 338-28.000.

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Nolf, Jean-Marie E.; Vansant, Jan L. M. F. G.; and Jensen, Michael L., 4,880,962, Cl. 219-549.000.
Puigcerver, Luis; Shimirak, Gerald; and Berth, Jorgen, 4,880,676, Cl. 428-35.700.
Sovish, Richard C.; Selleslags, Frank K. A.; and Moisson, Marc F. L., 4,879,799, Cl. 29-447.000.

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Roucaute, Philippe, 4,879,807, Cl. 29-828.000.

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Peregrim, Theodore J., 4,881,079, Cl. 342-194.000.
Read, Robert, to Schwinn Bicycle Company. Cycle computer with improved switch and push-button arrangement to facilitate resetting. 4,881,187, Cl. 364-565.000.
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Rirsch, Eric A.; and Barker, Howard A., 4,880,467, Cl. 106-85.000.
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McClean, James H.; Campbell, Neil A.; and Reid, Iain M., 4,881,177, Cl. 364-513.000.
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Krumm, Klemens, 4,880,370, Cl. 425-133.500.
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Reinz-Dichtungs GmbH: *See*—
Dorn, Karsten; Grosch, Peter; and Kremer, Ingo, 4,880,669, Cl. 427-210.000.
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Leininger, Ernest; Blum, Leonard; and Ponte, Gary W., 4,880,063, Cl. 169-37.000.
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Joder, Andreas; and Renggli, Franz, 4,881,027, Cl. 324-107.000.
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McMurtry, David R., 4,879,817, Cl. 33-502.000.
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Kaltbeitzel, Gunter; Klein, Michael; Renner, Martin; and Wolk, Joachim, 4,881,229, Cl. 371-20.400.
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Habicht, Siegfried; Reppert, Rainer; and Hocker, Eitel-Friedrich, 4,879,957, Cl. 109-79.000.
Research Corporation Technologies, Inc.: *See*—
Allcock, Harry R.; Austin, Paul E.; and Kwon, Sukky, 4,880,622, Cl. 424-78.000.
Gallaher, William R., 4,880,779, Cl. 514-15.000.
Research Development Corporation of Japan: *See*—
Hayaishi, Osamu; Ueno, Ryuji; and Kuno, Sachiko, 4,880,742, Cl. 435-238.000.
Kyushima, Hiroyuki; Nakamura, Kimitsugu; and Kato, Takahito, 4,881,008, Cl. 313-532.000.
Resli, Istvan; Takacs, Tibor; Damjanovich, Sandor; Gaspar, Rezso; Tron, Lajos; Szollosi, Janos; and Matko, Janos, to Innofinance Altalanos Innovacios Penzintezet. Process for the rapid determination of sperm cell count and/or living sperm count. 4,880,732, Cl. 435-29.000.
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Deal, Douglas O., 4,880,107, Cl. 198-779.000.
Reynolds, John D. Ground radon flux sampling device. 4,880,973, Cl. 250-253.000.
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Caldwell, Janice D.; and Knox, Walter H., III, 4,880,697, Cl. 428-35.400.
Reynolds, Robert R.: *See*—
Evans, Neil L.; Tombolato, Aldo L.; Reynolds, Robert R.; and Meisner, Robert J., 4,880,104, Cl. 198-445.000.
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Hayashi, Torahiko, 4,880,375, Cl. 425-335.000.
Rhodes, Alan, to Ethical Pharmaceuticals Limited. Slow release formulation. 4,880,830, Cl. 424-470.000.
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Chou, David T.; and Cain, Paul A., 4,880,838, Cl. 514-594.000.
Rhone-Poulenc Films: *See*—
Charmot, Dominique; and Grosjean, Pierre, 4,880,700, Cl. 428-337.000.
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Richards, David M. Table for holding work pieces for drilling, cutting and the like. 4,880,221, Cl. 269-139.000.
Richardson, Calvin: *See*—
Park, John J.; White, Paul W.; and Richardson, Calvin, 4,880,689, Cl. 428-143.000.
Ricoh Company, Ltd.: *See*—
Hayashi, Tadao, 4,881,130, Cl. 358-443.000.
Iiyama, Kiyotaka; and Hayakawa, Kunio, 4,880,762, Cl. 503-220.000.
Mochizuki, Hidehiro; Imamura, Masanaga; Suzuki, Akira; Shimada, Masaru; and Uemura, Hiroyuki, 4,880,768, Cl. 503-227.000.
Sumida, Hiroyasu, 4,881,101, Cl. 355-204.000.
Yamazaki, Hideo; and Kubota, Kazunori, 4,880,223, Cl. 271-293.000.
Riebel, Hans-Jochem: *See*—
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurrsen, Klaus, 4,880,932, Cl. 544-320.000.
Riffaud, Jean-Pierre: *See*—
Danree, Bernard; Faulques, Michelle; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, 4,880,807, Cl. 514-252.000.
Rifu, Toshihiro: *See*—
Nambu, Kyojiro; and Rifu, Toshihiro, 4,881,251, Cl. 378-7.000.
Riis, Trygve: *See*—
Eri, Sigrid; Goodwin, James G., Jr.; Marcelin, George; and Riis, Trygve, 4,880,763, Cl. 502-302.000.
Riker, Paul J.: *See*—
Christenson, Philip A.; Drake, Brian; and Riker, Paul J., 4,880,775, Cl. 512-12.000.
Ripka, Chester D.: *See*—
Boot, Jay L.; Ripka, Chester D.; and Shapiro, Ian M., 4,880,157, Cl. 236-25.00R.
Rirsch, Eric A.; and Barker, Howard A., to Redland Technology Limited. Cementitious dough or paste comprising at least one hydraulic element and at least one polymer latex. 4,880,467, Cl. 106-85.000.
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Tokura, Koichi; and Matsui, Goro, 4,881,149, Cl. 361-328.000.
Rizvi, Syed Q. A.: *See*—
Kostusyk, Joseph L.; and Rizvi, Syed Q. A., 4,880,553, Cl. 252-58.000.
Robert Bosch GmbH: *See*—
Bamer, Franz, 4,879,898, Cl. 73-118.200.
Buhren, Harald, 4,881,227, Cl. 371-9.000.
Drexel, Peter; Erne, Hans; Gosdowski, Gerhard; Gross, Karl; Kirsten, Ulrich; and Leisner, Ernst, 4,880,265, Cl. 294-86.400.
Lungu, Corneliu, 4,880,206, Cl. 251-129.210.
Rembold, Helmut; Linder, Ernst; and Haag, Gottlob, 4,879,984, Cl. 123-450.000.
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Robins, Roland K.; and Cottam, Howard B., to Brigham Young University. Antiviral methods utilizing ribofuranosylthiazolo[4,5-d]pyrimidine derivatives. 4,880,784, Cl. 514-48.000.
Robinson, Jeffery H.; and Dodd, Ian, to Beecham Group p.l.c. Plasmin A-chain urokinase B-chain hybrid protein. 4,880,776, Cl. 514-2.000.
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Thomas, Jeffrey A.; Robinson, Theodore S.; Ertl, Robert A.; and Christensen, Harold F., r., 4,881,163, Cl. 364-200.000.
Roboptek, Inc.: *See*—
Baker, Gregory G.; and Boyle, Edward F., 4,880,348, Cl. 414-783.000.
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Decima, Francois; and Rochon, Alain, 4,880,043, Cl. 152-526.000.
Rockwell, David A.; Mangir, Metin S.; White, Jeffrey O.; and Jones, Dennis C., to Hughes Aircraft Company. Optical device enhancement method and apparatus by control of stimulated brillouin scattering gain. 4,880,295, Cl. 350-354.000.
Rockwell International Corp.: *See*—
DeLong, Steven T.; and Snook, James E., 4,881,195, Cl. 364-900.000.
Dyke, Harry J.; and Korn, Yoram, 4,881,225, Cl. 370-95.100.
Oliphant, Jean R.; Workman, Harold W.; and Shah, Jasvantrai C., 4,881,261, Cl. 379-215.000.
Rody, Jean: *See*—
Slongo, Mario; Rody, Jean; Sitek, Franciszek; and Valet, Andreas, 4,880,859, Cl. 524-91.000.
Roemer, Peter B.: *See*—
Bottomley, Paul A.; Roemer, Peter B.; Edelstein, William A.; and Mueller, Otward M., 4,881,032, Cl. 324-309.000.
Roettger, Gerhard: *See*—
Stuecker, Erwin; and Roettger, Gerhard, 4,879,793, Cl. 29-156.80R.
Rogers, Larry D.: *See*—
Jacobs, James L.; and Rogers, Larry D., 4,880,491, Cl. 156-584.000.
Rohm, Gunter H. Self-tightening drill chuck. 4,880,246, Cl. 279-1.00K.
Rohm & Haas Company: *See*—
Kowalski, Alexander; and Vogel, Martin, 4,880,842, Cl. 521-64.000.
Roitberg, Michael: *See*—
Yabrov, Alexander A.; and Roitberg, Michael, 4,880,417, Cl. 604-355.000.

Rolfe, Jonathan L.: *See*—
Szycher, Michael; and Rolfe, Jonathan L., 4,880,690, Cl. 428-224.000.

Romano, John A.: *See*—
Boss, David W.; Carr, Timothy W.; Dubetsky, Derry J.; Greenstein, George M.; Grobman, Warren D.; Hayunga, Carl P.; Kumar, Amanda H.; Lange, Walter F.; Massey, Robert H.; Palmateer, Paul H.; Romano, John A.; and Shih, Da-Yuan, 4,880,684, Cl. 428-209.000.

Ronghi, Mario F.: *See*—
Cellini, John V.; Ronghi, Mario F.; and Geren, James G., 4,880,504, Cl. 202-185.600.

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Benedict, Roger J.; and Forlow, John K., 4,879,894, Cl. 72-405.000.

Rork, Gerald S.: *See*—
Haslam, John L.; and Rork, Gerald S., 4,880,631, Cl. 424-424.000.

Rose, Gene D.; Teot, Arthur S.; and Seymour, Keith G., to Dow Chemical Company, The. Fluorine containing viscoelastic surfactants. 4,880,565, Cl. 252-355.000.

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Chu, Daniel T.; Rosen, Terry J.; and Cooper, Curt S., 4,880,814, Cl. 514-300.000.

Rosenbaum, Georges: *See*—
Grollier, Jean-Francois; Allec, Josiane; Fourcadier, Chantal; Rosenbaum, Georges; and Darmenton, Patrick, 4,880,621, Cl. 424-74.000.

Rosenberg, Steven: *See*—
Burke, Rae L.; Rosenberg, Steven; Shuster, Jeffrey R.; Tekamp-Olson, Patricia; Valenzuela, Pablo D. T.; and Barr, Philip J., 4,880,734, Cl. 435-68.000.

Rossmark, Rene T. M., to NV Medicopharma. Disposable syringe. 4,880,410, Cl. 604-110.000.

Roth, Alfred C. Tapper/threader assembly. 4,879,929, Cl. 82-110.000.

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Roubo, Valerie J. Hair coloring implement. 4,880,019, Cl. 132-270.000.

Roucaute, Philippe, to Raychem Pontoise S.A. Method of making a sealed coaxial cable splice. 4,879,807, Cl. 29-828.000.

Rourke, Kenneth H.; and Hart, Raymond J., to TRW Inc. Multipurpose modular spacecraft. 4,880,187, Cl. 244-172.000.

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Roy, David C.; and Roy, Marjorie E. C., to Quaker Oats Company, The. Toy stacking and kicking mechanism. 4,879,989, Cl. 124-79.000.

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Johnson, Robert P.; and Johnson, Janice A., 4,879,882, Cl. 63-4.000.

Rubin, Harvey: *See*—
Cornelius, Paul A.; Hochstrasser, Robin M.; Kallenbach, Neville R.; Rubin, Harvey; and Todaro, George J., 4,880,512, Cl. 204-157.610.

Rudd, David; and Caines, R. Scott, to Hoechst Celanese Corporation. Moisture-resistant, coated thermoplastic film having enhanced adhesion to inks and metallic layers. 4,880,695, Cl. 428-341.000.

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Rutschle, Eugen: *See*—
Winkler, Hans-Henning; and Rutschle, Eugen, 4,879,802, Cl. 29-568.000.

Ryan, Edward T.: *See*—
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Ryobi Ltd.: *See*—
Ishii, Koji, 4,879,950, Cl. 101-217.000.

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Coppola, Frank; Dumbaugh, William H., Jr.; and Ryszytiwskyj, William P., 4,880,453, Cl. 65-23.000.

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Hub, Hans-Henning; Simon, Georg N.; Heinz, Gerhard; Ziegler, Walter; and Sadlowski, Juergen, 4,880,876, Cl. 525-67.000.

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Schroeder, George L.; Couch, Francis O.; and Saenguraiporn, Chamna, 4,881,221, Cl. 370-32.100.

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Saijo, Akira: *See*—
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Floreancig, Eligio M.; Jandrain, Jean-Claude M.; Legros, Desire M.; and Simonon, Jean-Claude M., 4,879,933, Cl. 83-76.100.

Saito, Hideo: *See*—
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihiro, 4,880,277, Cl. 297-467.000.

Saito, Ken-Ichi: *See*—
Ninomiya, Kunihiro; Saito, Ken-Ichi; Morita, Shuji; Tobe, Akihiro; and Nitta, Issei, 4,880,819, Cl. 514-316.000.

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Takeuchi, Kenichi; Saito, Shin; Araki, Shoji; and Nakayama, Atsushi, 4,881,253, Cl. 379-54.000.

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Kasai, Masaji; Kanda, Yutaka; Kono, Motomichi; Saito, Yutaka; Morimoto, Makoto; and Ashizawa, Tadashi, 4,880,825, Cl. 514-409.000.

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Saji, Mikio: *See*—
Hoshino, Akira; Saji, Mikio; and Yamaguchi, Isamu, 4,880,852, Cl. 523-102.000.

Sakai, Motohiro, to Tokai TRW & Co., Ltd. Joint. 4,880,329, Cl. 403-134.000.

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Sakanoue, Kei: *See*—
Shiba, Keisuke; Ichijima, Seiji; Sakanoue, Kei; and Taguchi, Seiichi, 4,880,726, Cl. 430-376.000.

Sakauchi, Iwao: *See*—
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Sakurai, Motoi: *See*—
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Bulatovic, Srdjan; and Salter, Robert S., 4,880,529, Cl. 209-167.000.

Saltzberg, Burton R., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Manchester code receiver. 4,881,059, Cl. 341-70.000.

Salumbides, Renato R.: *See*—
Kuhlemann, Bruce W.; Macabasco, Agilio E.; and Salumbides, Renato R., 4,880,425, Cl. 604-404.000.

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Samsonite Corporation: *See*—
Mobley, Lawrence R., 4,880,113, Cl. 206-287.000.

Samsung Semiconductor and Telecommunications Co., Ltd.: *See*—
Min, Sung-Ki; Myung, Chan-Kyu; and Shin, Ki-Ho, 4,881,042, Cl. 329-326.000.

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Sanabria, Ronaldo M., 4,880,327, Cl. 402-73.000.

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Sanden Corporation: *See*—
Terauchi, Kiyoshi; and Hiraga, Masaharu, 4,880,360, Cl. 417-222.000.

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Himes, Glenn R.; and Sanders, Andrea, 4,880,878, Cl. 525-89.000.

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Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Sands, Keith P., 4,880,640, Cl. 426-3.000.

Saneii, Hossain H.: *See*—
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Sano, Takezo: *See*—
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Sano, Yoshinori: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,880,857, Cl. 523-205.000.

Sansom, Bernard F.: *See*—
Allen, William M.; Sansom, Bernard F.; Wilson, Alan D.; Prosser, Havard J.; and Groffman, David M., 4,880,628, Cl. 424-605.000.

Sanyo Electric Co., Ltd.: *See*—
Itou, Tsukasa; Kawase, Ryuji; Morioka, Yuji; and Ichiba, Masao, 4,880,435, Cl. 29-623.500.
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, 4,881,196, Cl. 364-900.000.

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Terui, Nobuhiko; Kusaka, Yosuke; Shiokama, Yoshiharu; and Sasagaki, Nobuaki, 4,881,094, Cl. 354-286.000.

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Maeda, Mitsuaki; and Sasaki, Takuma, 4,880,832, Cl. 514-492.000.

Sassenfeld, Helmut M.: *See*—
Brewer, Stephen J.; and Sassenfeld, Helmut M., 4,880,911, Cl. 530-351.000.

Sato, Haruki: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; Suzuki, Fumio; Habara, Hideaki; Fukuda, Yutaro; and Sato, Haruki, 4,880,877, Cl. 525-84.000.

Sato, Hiroshi; Tanaka, Kazumi; Kushida, Naoki; Katayama, Masato; Tamura, Yasuyuki; Hasegawa, Tetsuo; Yaegashi, Hisao; Kaneko, Shuzo; Tohma, Koichi; and Suzuki, Takayuki, to Canon Kabushiki Kaisha. Transfer method for heat-sensitive transfer recording. 4,880,324, Cl. 400-241.000.

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Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, 4,880,986, Cl. 250-484.100.

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Sato, Ryo: *See*—
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,880,925, Cl. 544-105.000.

Sato, Shigeji: *See*—
Yamahira, Yoshiya; Okuzawa, Yoshiko; Fujioka, Keiji; Sato, Shigeji; and Ishikawa, Reimei, 4,880,796, Cl. 514-206.000.

Sato, Shohei, to Omron Tateisi Electronics Co. Ultrasonic probe. 4,880,012, Cl. 128-663.010.

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Matsuda, Masami; Funabashi, Kiyomi; Nishi, Takashi; Komori, Itaru; Baba, Tsutomu; Yusa, Hideo; Uchida, Shunsuke; Adachi, Tetsuro; Ohsumi, Katsumi; and Sato, Tomohiro, 4,880,595, Cl. 376-313.000.

Sato, Yukio: *See*—
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Sato, Yutaka: *See*—
Yoshioka, Teruo; Nakano, Shoji; and Sato, Yutaka, 4,879,797, Cl. 29-240.000.

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Satow, Arnold: *See*—
Coch, Lester G.; and Satow, Arnold, 4,880,132, Cl. 220-83.000.

Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., to General Motors Corporation. Composite tread for track-laying vehicles. 4,880,283, Cl. 305-35.00R.

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Guesnet, Patrice; Kawamura, Tetsuchi; Savin, Gerard; Poncet, Sabine; and Castera, Charles, 4,880,552, Cl. 252-34.000.

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Hester, Jackson B., Jr.; Thaisrivongs, Suvit; Sawyer, Tomi K.; TenBrink, Ruth E.; Saneii, Hossain H.; Schostarez, Heinrich J.; and Pals, Donald T., 4,880,781, Cl. 514-18.000.

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Scalise, Donna J.: *See*—
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Holroyd, Nigel J. H.; Hepples, Warren; and Scamans, Geoffrey M., 4,880,709, Cl. 428-654.000.

Schaefle, Jean: *See*—
Bugnon, Philippe; Grubenmann, Arnold; Medinger, Bernhard; and Schaefle, Jean, 4,880,472, Cl. 106-493.000.

Schaff, Jean-Paul. Protection of sensitive electrical installations against the effects of lightning, and devices proposed for such arrangement. 4,881,147, Cl. 361-118.000.

Schafferkotter, Harvey W. Device for cutting molding and method therefor. 4,880,042, Cl. 144-372.000.

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Brueck, Steven R. J.; Schaus, Christian F.; Osinski, Marek A.; McInerney, John G.; Raja, M. Yasin A.; Brennan, Thomas M.; and Hammons, Burrell E., 4,881,236, Cl. 372-45.000.

Scheer, Martin: *See*—
Lindel, Hans; Ingendoh, Axel; Berschauer, Friedrich; de Jong, Anno; and Scheer, Martin, 4,880,840, Cl. 514-645.000.

Scherrer, Fernand, to Periso SA Elektro-Industrie. Double filter insert for an air cleaning apparatus. 4,880,448, Cl. 55-103.000.

Scherzer, Julius, to Union Oil Company of California. Process for the cracking of feedstocks containing high levels of nitrogen. 4,880,521, Cl. 208-120.000.

Schetty, Robert A.: *See*—
Toben, Michael P.; Brown, Neil D.; Esterl, David J.; and Schetty, Robert A., 4,880,507, Cl. 204-44.400.

Schieferly, Stephen B. Slidelatch securing post. 4,880,392, Cl. 439-347.000.

Schiel, Christian, to J.M. Voith GmbH. Press cover for a press for dewatering web material. 4,880,501, Cl. 162-358.000.

Schieren, Hugh P.: *See*—
Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 4,880,635, Cl. 424-450.000.

Schiller, David S.: *See*—
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Schinski, Erhard: *See*—
Wahle, Bernd; Anzinger, Hermann; Ziche, Horst; and Schinski, Erhard, 4,880,898, Cl. 528-272.000.

Schirmer, Ulrich: *See*—
Kolassa, Dieter; Keil, Michael; Schirmer, Ulrich; Theobald, Hans; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,880,456, Cl. 71-88.000.

Schittenhelm, Rudolf: *See*—
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Schleizer, William A.: *See*—
Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L., 4,880,211, Cl. 266-44.000.

Schlemmer, Lothar: *See*—
Klimesch, Roger G.; Bleckmann, Gerhard; Farwerck, Karl-Peter; Goertz, Hans-Helmut; and Schlemmer, Lothar, 4,880,585, Cl. 264-141.000.

Schleusener, Eckart, to Sandoz Ltd. Mixtures of an acylated polyamine and an alcohol-ether useful for textile finishing. 4,880,430, Cl. 8-188.000.

Schlumberger Technology Corporation: *See*—
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Schmid, Eckhardt: *See*—
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Schmidt, Gunther: *See*—
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Schmidt, Kenneth D., to ACF Industries, Incorporated. Fluidization kit for pneumatic discharge outlet. 4,880,148, Cl. 222-195.000.

Schmidt, Robert R.: *See*—
Moriya, Koichi; Pfister, Theodor; Riebel, Hans-Jochem; Eue, Ludwig; Schmidt, Robert R.; and Lurrsen, Klaus, 4,880,932, Cl. 544-320.000.

Schmier, Larry J.: *See*—
Clark, Mark E.; Greever, Richard G.; Schmier, Larry J.; and Wong, Jerome D., 4,881,230, Cl. 371-20.100.

Schneider, Irwin: *See*—
Foster, David R.; and Schneider, Irwin, 4,881,234, Cl. 372-42.000.

Schniederjan, Reinhold: *See*—
Hoffmeister, Hermann; Puvogel, Klaus; and Schniederjan, Reinhold, 4,880,359, Cl. 417-216.000.

Schoen, Robert: *See*—
Ludwig, Marcel; Schoen, Robert; and Elchinger, Othon, 4,880,103, Cl. 198-434.000.

Schohe, Rudolf; Glaser, Thomas; Traber, Jorg; and Allen, George S., to Bayer Aktiengesellschaft. Substituted basic 2-aminotetralin useful as cardiotonic agents. 4,880,802, Cl. 514-222.200.

Scholefield, John; and Johnston, Robert, to Automated Bacteria Counting Limited. Liquid metering device. 4,880,149, Cl. 222-207.000.

Scholl, Wolfgang: *See*—
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Schonafinger, Karl; and Hu Ong, Helen, to Hoechst-Roussel Pharmaceuticals, Inc. 1-Acyl-4-[1-(4-quinolinyl)-hydrazin-2-ylidene]piperidines and their use as hypotensive agents. 4,880,818, Cl. 514-313.000.

Schostarez, Heinrich J.: *See*—
Hester, Jackson B., Jr.; Thaisrivongs, Suvit; Sawyer, Tomi K.; TenBrink, Ruth E.; Saneii, Hossain H.; Schostarez, Heinrich J.; and Pals, Donald T., 4,880,781, Cl. 514-18.000.

Schrack Elektronik-Aktiengesellschaft: *See*—
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Schrankel, Kenneth R.: *See*—
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Schroder, Michael: *See*—
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Schroder, Norbert: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; and Schroder, Norbert, 4,880,172, Cl. 241-101.200.

Schroeder, George L.; Couch, Francis O.; and Saengurairporn, Chamna, to Kentrox Industries, Inc. Method and apparatus for disabling an echo canceller on a digital telecommunications network. 4,881,221, Cl. 370-32.100.

Schuco International GmbH & Co.: *See*—
Habicht, Siegfried; Reppert, Rainer; and Hocker, Eitel-Friedrich, 4,879,957, Cl. 109-79.000.

Schulhofer, Anton: *See*—
Jerlich, Werner J.; Kugler, Alfred; Kaiserfeld, Hans; Schulhofer, Anton; and Zechner, Werner, 4,880,481, Cl. 148-325.000.

Schulte, Agnes: *See*—
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Schulz, Donald N.: *See*—
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Schumann, Herbert: *See*—
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 4,880,492, Cl. 156-610.000.

Schurgin, Jeffrey S. Traveling toothbrush holder. 4,880,020, Cl. 132-308.000.

Schutz, Erwin; and Vollbrecht, Heinz-Rudiger, to SKW Trostberg Aktiengesellschaft. Process for the dearomatizing and rearomatizing tea. 4,880,656, Cl. 426-386.000.

Schutze, Wolfgang: *See*—
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Schwab & Co. Ges.m.b.H.: *See*—
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Schwarz, Robert A.: *See*—
Patel, Navinchandra R.; and Schwarz, Robert A., 4,881,001, Cl. 310-258.000.

Schwendemann, Kenneth L.; and Noack, Timothy J., to Halliburton Company. Valve control system. 4,880,060, Cl. 166-336.000.

Schwinn Bicycle Company: *See*—
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Scientific-Atlanta, Inc.: *See*—
Goodrich, Jeffrey A.; Poe, Charles M., Jr.; and Praha, Jeffrey A., 4,880,966, Cl. 250-231.00R.

Scordato, James, to Dynascan Corporation. Answering machine with cordless telephone. 4,881,259, Cl. 379-58.000.

Scott, David Duane: *See*—
Scott, Russell E., 4,881,153, Cl. 362-78.000.

Scott, Donald S.; and Piskorz, Jan, to Canadian Patents & Development Ltd. Process for the production of fermentable sugars from biomass. 4,880,473, Cl. 127-37.000.

Scott, John C.; Li, Eric K.; Washburn, Hudson A.; and Viswanathan, Nal T., to Akshic Memories Corporation. Method of making a thin film magnetic disk. 4,880,514, Cl. 204-192.200.

Scott, Russell E., to Scott, David Duane. Vehicle wheel lighting system. 4,881,153, Cl. 362-78.000.

Seagate Technology, Inc.: *See*—
Ghose, Sanjoy; Bronshvatch, Efim; and Peterson, Miles L., 4,881,140, Cl. 360-106.000.

Sears Manufacturing Company: *See*—
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Seasholtz, Craig A.: *See*—
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Sebag, Henri: *See*—
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Seichter, Helmut: *See*—
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Seikosha Co., Ltd.: *See*—
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Seiler, Erhard: *See*—
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Seitetsu Kagaku Co., Ltd.: *See*—
Obayashi, Shigeji; Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,880,888, Cl. 526-209.000.

Seki, Youichi: *See*—
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Sekikawa, Ayako: *See*—
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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
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Sekizaki, Satoshi, to Honda Giken Kogyo Kabushiki Kaisha. Transmission equipped with reverse mechanism. 4,879,919, Cl. 74-337.500.

Seko, Tatsushi: *See*—
Suzuki, Tsutomu; Seko, Tatsushi; Tobita, Kuniharu; Matsubayashi, Saburo; Kougo, Nobuhiko; Ogawa, Kiyoshi; Taniguchi, Susumu; Minami, Masaharu; Hayakawa, Masayuki; and Kawada, Noriyuki, 4,879,788, Cl. 26-94.000.

Selleslags, Frank K. A.: *See*—
Sovish, Richard C.; Selleslags, Frank K. A.; and Moisson, Marc F. L., 4,879,799, Cl. 29-447.000.

Semura, Norio; Tsuchida, Masumi; and Shimamura, Yoshihiro, to ASMO Co., Ltd. Method for mounting a plurality of brushes. 4,879,803, Cl. 29-598.000.

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Senkowski, Bernard Z.: *See*—
Dastoli, Frank R.; Senkowski, Bernard Z.; Wagener, Dieter W.; Bogdanffy, George H.; and Vin, Gaurang R., 4,880,581, Cl. 264-39.000.

Sens, Ruediger: *See*—
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Seoul Nassau Corporation: *See*—
Song, Chul-Ho, 4,880,233, Cl. 273-60.00R.

Seppelt, Wolfgang; Hofmeister, Peter; and Kuenast, Christoph, to BASF Aktiengesellschaft. N-benzoyl-n'-(2,3-dichloro-4-phenoxy)-phenylureas. 4,880,837, Cl. 514-594.000.

Sergeant, Ronald G.; and VanDerStuyf, Allen F., to AMP Incorporated. Method for electrical wiring utilizing wire retainer. 4,879,810, Cl. 29-861.000.

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Mochizuki, Shigehiko; Kanda, Masahiro; and Serizawa, Yoshinori, 4,880,389, Cl. 439-125.000.

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Seto, Yutaka; Suzuki, Shigehiro; Suzuki, Tomohiro; Fujita, Atsushi; Tai, Akira; and Yoshino, Masahiro, to Konica Corporation. Developing apparatus. 4,881,103, Cl. 355-251.000.

Sevelinge, Gerard, to Framatome. Positioning device for screwing and unscrewing a nut. 4,879,927, Cl. 81-56.000.

Seyman, Michael J.: *See*—
Bowlin, David A.; and Seyman, Michael J., 4,880,468, Cl. 106-98.000.

Seymour, Keith G.: *See*—
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SGS-ATES Componenti Elettronici S.p.A.: *See*—
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SGS-Thomson Microelectronics S.A.: *See*—
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Shah, Bakulesh N.: *See*—
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Shah, Jasvantrai C.: *See*—
Oliphant, Jean R.; Workman, Harold W.; and Shah, Jasvantrai C., 4,881,261, Cl. 379-215.000.

Shapiro, Eugene: *See*—
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Boot, Jay L.; Ripka, Chester D.; and Shapiro, Ian M., 4,880,157, Cl. 236-25.00R.

Sharma, Ravinder K.; Geyer, Harry J.; and Mitchell, Douglas G., to Motorola, Inc. Metallization scheme providing adhesion and barrier properties. 4,880,708, Cl. 428-620.000.

Sharp Kabushiki Kaisha: *See*—
Deguchi, Toshihisa; Fujii, Yoshikazu; Inui, Tetsuya; Ohta, Kenji; and Katoh, Schohichi, 4,881,216, Cl. 369-54.000.
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Shaw, John E. A.; and Webb, Brian C., to Thorn EMI PLC. Ionic conductivity accelerometer. 4,879,904, Cl. 73-517.00R.

Shaw, Raymond W.: *See*—
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Shea, Robert F., to McNeil (Ohio) Corporation. Console for holding and housing cleaning and lubrication equipment. 4,880,144, Cl. 222-173.000.

Sheehan, Michael T.; and Shah, Bakulesh N., to Hoechst Celanese Corporation. Hot melt adhesives containing poly(p-hydroxystyrene) homopolymers and copolymers and bonding methods employing same. 4,880,487, Cl. 156-327.000.

Shell Oil Company: *See*—
Douglas, Paul L., 4,880,583, Cl. 264-130.000.
George, Eric R., 4,880,865, Cl. 524-449.000.
Goodall, Brian L.; and Grotenhuis, Paulus A. M., 4,880,546, Cl. 210-699.000.
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Semura, Norio; Tsuchida, Masumi; and Shimamura, Yoshihiro, 4,879,803, Cl. 29-598.000.

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Shin-Etsu Chemical Co., Ltd.: *See*—
Takago, Toshio; and Yamamoto, Yasushi, 4,880,927, Cl. 544-193.000.
Shin, Ki-Ho: *See*—
Min, Sung-Ki; Myung, Chan-Kyu; and Shin, Ki-Ho, 4,881,042, Cl. 329-326.000.
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Yoshinaga, Kazuo; Katagiri, Kazuharu; and Shinjo, Kenji, 4,880,560, Cl. 252-299.010.
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Ohara, Sosaburo; Ikeda, Atsushi; Shinohara, Seigo; and Kijima, Tetsuo, 4,880,557, Cl. 252-174.150.
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Ogihara, Masuo; Ishida, Hiroyuki; Nagaoka, Shinji; Seki, Youichi; Tagami, Shigeru; Yamazaki, Hiroshi; and Shinozaki, Nobuo, 4,881,096, Cl. 354-400.000.
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Terui, Nobuhiko; Kusaka, Yosuke; Shiokama, Yoshiharu; and Sasagaki, Nobuaki, 4,881,094, Cl. 354-286.000.
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Shionogi & Co., Ltd.: *See*—
Homan, Morio; Sugie, Nizo; Yoshimura, Masakiyo; and Shirakawa, Yoshikazu, 4,880,702, Cl. 428-354.000.
Shionoya, Kazunori: *See*—
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Shires, Charles D.: *See*—
Barrus, Donald M.; Shires, Charles D.; and Brummond, William A., 4,880,596, Cl. 376-336.000.
Shitori, Yoshiyasu: *See*—
Fujita, Shuji; Yoshimura, Shoji; Ito, Masayoshi; Shitori, Yoshiyasu; and Ogawa, Tomoya, 4,880,572, Cl. 260-404.000.
Shiue, Fong: *See*—
Chen, Hong-Bin; Chang, Lien-Kuei; Tsay, Shern-Ji; Chou, Tung-Sheng; and Shiue, Fong, 4,879,905, Cl. 73-579.000.
Shizuoka Seiki Co., Ltd.: *See*—
Kuwabara, Youhei; Asaoka, Teruo; Yoshioka, Shogo; and Sugiyama, Haruki, 4,880,509, Cl. 204-129.200.
Kuwabara, Youhei; Asaoka, Teruo; and Iwasaki, Yasuhiro, 4,880,516, Cl. 204-224.00M.
Shoei Jushi Co., Ltd.: *See*—
Shimizu, Shoji, 4,880,674, Cl. 428-31.000.
Shop-Vac Corporation: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., 4,880,364, Cl. 417-423.100.
Short Brothers PLC: *See*—
McClean, James H.; Campbell, Neil A.; and Reid, Iain M., 4,881,177, Cl. 364-513.000.
Shouda, Masahiro, to NEC Corporation. Debugging microprocessor. 4,881,228, Cl. 371-19.000.
Shovar, John S., to Sears Manufacturing Company. Seat assembly. 4,880,276, Cl. 297-452.000.
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Sasakawa, Shigeru; and Shiba, Masayuki, 4,880,786, Cl. 514-53.000.
Shroot, Braham; Watts, Oliver; Gazith, Joseph; and Cavey, Marie-Therese, to Centre International de Recherches Dermatologique (CIRD). Trittum labelled compound, its preparation and its use in the determination of the affinity of retinoids for their cellular receptor. 4,880,941, Cl. 549-57.000.
Shuert, Lyle H. Plastic pallet. 4,879,956, Cl. 108-53.300.
Shuey, John R.: *See*—
Beamenderfer, Robert E.; Long, William B.; and Shuey, John R., 4,880,388, Cl. 439-108.000.
Shuman, Richard F., to Merck & Co., Inc. Process for the preparation of 3-((4-bromo-2-fluorophenyl)methyl)-3,4-dihydro-4-oxo-1-phthalazine-acetic acid. 4,880,928, Cl. 544-237.000.
Shuster, Jeffrey R.: *See*—
Burke, Rae L.; Rosenberg, Steven; Shuster, Jeffrey R.; Tekamp-Olson, Patricia; Valenzuela, Pablo D. T.; and Barr, Philip J., 4,880,734, Cl. 435-68.000.
Sicam Societa' Italiana Cuscini A Molle S.p.A.: *See*—
Brambilla, Silvio, 4,880,268, Cl. 296-65.100.
Siebold, Horst, to Siemens Aktiengesellschaft. Magnetic structural arrangement of an installation for nuclear magnetic resonance tomography with superconducting background field coils and normal-conducting gradient coils. 4,881,035, Cl. 324-320.000.
Siegel, Paul H.: *See*—
Ashley, Jonathan J.; Call, Mark G.; and Siegel, Paul H., 4,881,076, Cl. 341-95.000.
Siemens Aktiengesellschaft: *See*—
Haberer, Herbert, 4,881,242, Cl. 375-118.000.
Habrich, Reiner; and Bayer, Heiner, 4,880,662, Cl. 427-54.100.
Haug, Friedrich, 4,881,244, Cl. 375-36.000.
Holtz, Joachim; Salama, Samir; and Salzmann, Theodor, 4,881,159, Cl. 363-58.000.
Hums, Erich, 4,880,378, Cl. 431-170.000.
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.
Niedermayr, Erich; and Griessbach, Robert, 4,880,992, Cl. 250-561.000.
Reichbauer, Hermann; Mueller, Rudi; and Riccato, Aldo, 4,881,074, Cl. 340-825.050.
Reichenberger, Helmut; and Schittenhelm, Rudolf, 4,879,993, Cl. 128-24.00A.
Siebold, Horst, 4,881,035, Cl. 324-320.000.
Stuecker, Erwin; and Roettger, Gerhard, 4,879,793, Cl. 29-156.80R.
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Stuecker, Erwin; Hofer, Gerhard; Koch, Dietmar; and Guenes, Uenal, 4,881,030, Cl. 324-209.000.
Sierk, Anthony H. Combination range pole and bubble-level therefor. 4,879,816, Cl. 33-295.000.
Sievers, Axel: *See*—
Jung, Werner; Klesse, Christoph; and Sievers, Axel, 4,880,889, Cl. 526-323.000.
Signoretto, Roberto, to Photo Engineering S.R.L. Method and apparatus for identifying negatives in photographic laboratories. 4,881,090, Cl. 354-105.000.
Sigwalt, Paul: *See*—
Pfeiffer, Pierre; Cheval, Benoit; and Sigwalt, Paul, 4,880,138, Cl. 220-320.000.
Siller, Bruno. Atmospheric oxygen element with regenerating manganese chloride solution as electrolyte. 4,880,710, Cl. 429-13.000.
Silva, Jeffrey T. Apparatus for inspecting twist drills. 4,879,813, Cl. 33-201.000.
Simon, Allen H.: *See*—
Sprague, David L.; Harney, Kevin; Simon, Allen H.; and Taylor, Herbert H., Jr., 4,881,194, Cl. 364-900.000.
Simon, B. Kenneth. Cushioned container for hazardous material. 4,880,119, Cl. 206-584.000.
Simon, Georg N.: *See*—
Hub, Hans-Henning; Simon, Georg N.; Heinz, Gerhard; Ziegler, Walter; and Sadlowski, Juergen, 4,880,876, Cl. 525-67.000.
Simon, Jean: *See*—
Gourronc, Eugene, 4,879,966, Cl. 118-207.000.
Simonon, Jean-Claude M.: *See*—
Floreancig, Eligio M.; Jandrain, Jean-Claude M.; Legros, Desire M.; and Simonon, Jean-Claude M., 4,879,933, Cl. 83-76.100.
Sims, Rowell: *See*—
Ferre, F. Budd; Sims, Rowell; Bowen, Wesley G.; and Kesler, Vibert L., 4,880,026, Cl. 137-234.600.
Sitek, Franciszek: *See*—
Slongo, Mario; Rody, Jean; Sitek, Franciszek; and Valet, Andreas, 4,880,859, Cl. 524-91.000.
Sites, Royal H.: *See*—
Garcia, Richard R.; and Sites, Royal H., 4,881,057, Cl. 338-28.000.
Siwinski, Paul P.: *See*—
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Sjostrand, Jorgen, to Bronnums Maskinfabrik A/S. Conveyor. 4,879,841, Cl. 47-59.000.
SKF France: *See*—
Message, Olivier, 4,880,093, Cl. 192-45.100.
SKF Industrial Trading & Development Co. B.V.: *See*—
Merkelbach, Boy, 4,880,281, Cl. 301-124.00R.
SKF Nova AB: *See*—
Adolfsson, Rune, 4,880,153, Cl. 228-2.500.
Skinner, Malcolm: *See*—
Farrar, David; Flesher, Peter; Skinner, Malcolm; Clarke, John; Marshall, David; and Hawe, Malcolm, 4,880,858, Cl. 524-60.000.

Skirha, Martin D.: *See—*
Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., 4,880,283, Cl. 305-35.00R.

SKW Trostberg Aktiengesellschaft: *See—*
Meyer-Grunow, Hartmut, 4,880,462, Cl. 75-253.000.
Schutz, Erwin; and Vollbrecht, Heinz-Rudiger, 4,880,656, Cl. 426-386.000.

Slade, Paul G.: *See—*
Fey, Maurice G.; Lange, William J.; Freidhoff, Carl B.; and Slade, Paul G., 4,880,947, Cl. 200-144.00B.

Slater, Clifton G.: *See—*
Murray, Alexander P.; Slater, Clifton G.; and White, Robert W., 4,880,559, Cl. 252-186.210.

Slatter, John A. G.: *See—*
Paxman, David H.; Slatter, John A. G.; and Coe, David J., 4,881,119, Cl. 357-23.400.

Slongo, Mario; Rody, Jean; Sitek, Franciszek; and Valet, Andreas, to Ciba-Geigy Corporation. Light-stabilized star polymer microparticles. 4,880,859, Cl. 524-91.000.

Smetana, Bruce A.: *See—*
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.

Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., to Barnes Group Inc. Method for making plastic leaded chip carrier. 4,879,808, Cl. 29-845.000.

Smith, Kenneth W.: *See—*
Graves, William H., Jr.; Wallace, Gary W.; Bradford, Bruce P.; Carpenter, Carolyn R.; Smith, Kenneth W.; and Toft, Howard C., 4,880,018, Cl. 131-375.000.

Smith, Richard B.: *See—*
Birman, Stephen P.; Smith, Richard B.; and Thompson, Richard L., 4,880,479, Cl. 148-320.000.

Smith, Richard C.; Bartko, John; and Fero, Arnold H., to Westinghouse Electric Corp. Measuring nuclear fuel burnup. 4,881,247, Cl. 376-257.000.

Smith, Steve: *See—*
Shemitz, Sylvan R.; Lepak, Theodore; and Smith, Steve, 4,881,156, Cl. 362-220.000.

Smith, Thomas A.: *See—*
Carpenter, Thomas L.; Fisher, William; and Smith, Thomas A., 4,880,645, Cl. 426-89.000.

Smutny, Edgar J.: *See—*
Lutz, Robert G.; and Smutny, Edgar J., 4,880,863, Cl. 524-377.000.

Snap-on Tools Corporation: *See—*
Butzen, James K.; Happ, Kenneth C.; and Giese, Robert D., 4,879,847, Cl. 51-170.00R.

Snel, Johannes J. M.: *See—*
van Doorn, Johannes A.; Snel, Johannes J. M.; Meijboom, Nicolaas; and Wife, Richard L., 4,880,900, Cl. 528-392.000.

Snook, James E.: *See—*
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Societa Italiana Catene Calibrate Regina S.p.A.: *See—*
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Societe Anonyme dite: Alsthom: *See—*
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Grollier, Jean-Francois; Allec, Josiane; Fourcadier, Chantal; Rosenbaum, Georges; and Darmenton, Patrick, 4,880,621, Cl. 424-74.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Guesnet, Patrice; Kawamura, Tetsuchi; Savin, Gerard; Poncet, Sabine; and Castera, Charles, 4,880,552, Cl. 252-34.000.

Soga, Akihiro: *See—*
Nishijima, Masaru; and Soga, Akihiro, 4,881,102, Cl. 355-243.000.

Sogame, Eiji: *See—*
Koyari, Yukio; Sogame, Eiji; Kishimoto, Kanji; and Kakuma, Yojiro, 4,879,874, Cl. 60-259.000.

Solarex Corporation: *See—*
O'Dowd, James G.; Catalano, Anthony W.; Fortmann, Charles M.; and Lee, Ora J., 4,880,664, Cl. 427-109.000.

Solfest, Patricia A.: *See—*
Strangman, Thomas E.; and Solfest, Patricia A., 4,880,614, Cl. 428-623.000.

Soll, David B.; and Failla, Stephen J. Method of making the sclera and/or limbus in intraocular surgery. 4,880,017, Cl. 128-898.000.

Sollinger, Hans-Peter; Meinecke, Albrecht; Weiss, Hans; and Beiswanger, Rudolf, to J. M. Voith GmbH. Method and apparatus for coating running webs. 4,880,671, Cl. 427-356.000.

Solomon, David E.; and Hillegas, William J. Filter-separator pour-out cap. 4,880,140, Cl. 220-371.000.

Solvay & Cie. (Societe Anonyme): *See—*
Gago, Ignace; and Detroz, Rene , 4,879,839, Cl. 47-57.600.

Soma, Masahiro; and Tanaka, Shinya, to Alps Electric Co., Ltd. X-Y position input apparatus including preventing dust interference. 4,881,065, Cl. 340-710.000.

Somar Corporation: *See—*
Matsuo, Takao; Hamamura, Fumio; and Sumi, Shigeo, 4,880,488, Cl. 156-344.000.

Somfy: *See—*
Jacquel, Dominique, 4,881,219, Cl. 364-400.000.

Sone, Toshinao: *See—*
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Song, Chul-Ho, to Seoul Nassau Corporation. Game ball. 4,880,233, Cl. 273-60.00R.

Sony Corporation: *See—*
Meguro, Hiroshi; Yamamoto, Yoshinori; Ohyama, Masao; Horikawa, Kenichi; Mizusawa, Shigeru; and Kawakami, Kenji, 4,881,137, Cl. 360-96.500.
Ohki, Hiroshi, 4,881,217, Cl. 369-132.000.
Sako, Yoichiro; and Yamamura, Shinichi, 4,881,232, Cl. 371-37.400.
Takeuchi, Kenichi; Saito, Shin; Araki, Shoji; and Nakayama, Atsushi, 4,881,253, Cl. 379-54.000.
Watanabe, Kazuo; and Yumoto, Akira, 4,881,203, Cl. 365-203.000.
Watanabe, Osamu; Komatsu, Kosuke; Ishibashi, Masaichi; Kimura, Mutsumi; Koyama, Shinsuke; Fujimori, Takahiro; Fujiwara, Tadashi; and Kuroiwa, Junko, 4,881,067, Cl. 340-750.000.
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Sota Technology, Inc.: *See—*
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Soukup, Jiri: *See—*
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Soundwave Fidelity Corporation: *See—*
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Southco, Inc.: *See—*
Bisbing, Robert H., 4,880,261, Cl. 292-7.000.

Southern Pacific Transportation Co.: *See—*
Austill, Robert J.; and Lambert, Joseph M., 4,880,190, Cl. 246-107.000.

Southwest Research Institute: *See—*
Lew, Chel W.; and Barlow, Darren E., 4,880,646, Cl. 426-93.000.

Sovish, Richard C.; Selleslags, Frank K. A.; and Moisson, Marc F. L., to Raychem Corporation. Heat-recoverable article. 4,879,799, Cl. 29-447.000.

Sowell, Wendell L. Variable exerciser. 4,880,227, Cl. 272-118.000.

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Melvin, Terrence; and Nesbitt, R. Dennis, 4,880,241, Cl. 273-232.000.

Spanjer, Jacobs J.; and Rademaker, Pieter D., to Aardelite Holding B. V. Hardening granulated material at elevated temperatures. 4,880,582, Cl. 264-82.000.

Spayd, Richard W.: *See—*
Burdick, Brent A.; Wu, Tai-Wing; Hilborn, David A.; and Spayd, Richard W., 4,880,749, Cl. 436-66.000.

Spear, Scott A.: *See—*
Carson, Steven R.; Griffin, Raymond T.; and Spear, Scott A., 4,880,950, Cl. 200-547.000.

Speas, Gary W., to POM Incorporated. Park card system for electronic parking meter. 4,880,097, Cl. 194-239.000.

Speath Design: *See—*
Vicenes, Rudy, 4,879,838, Cl. 47-45.000.

Specialty Hoisting Services, Inc.: *See—*
Cucksey, Fred, 4,880,210, Cl. 256-26.000.

Spee-Dee Packaging Machinery Inc.: *See—*
Navin, James P.; Shilhavy, Ronald A.; and Christensen, Gary M., 4,880,150, Cl. 222-346.000.

Speiser, Peter, to Dr. Rentschler Arzneimittel GmbH & Co. Lipid nano-pellets as excipient system for perorally administered drugs. 4,880,634, Cl. 424-450.000.

Spencer, Kenneth B.: *See—*
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.

Spencer, R. Wilson. Sample injection means. 4,879,915, Cl. 73-864.740.

Spinelli, Louis A.; and Jenniges, Jeffrey M., to Nabisco Brands, Inc. Apparatus of machining doughy material. 4,880,371, Cl. 425-135.000.

Spinelli, Pia: *See—*
Capizzi, Amedeo; Arsura, Emilio; and Spinelli, Pia, 4,879,837, Cl. 43-124.000.

Spinner, Georg; Pitschi, Franz-Xaver; and Linnerbauer, Horst, to Spinner GmbH, Elektrotechnische Fabrik. Switch drive for a rotary switch. 4,880,949, Cl. 200-501.000.

Spinner GmbH, Elektrotechnische Fabrik: *See—*
Spinner, Georg; Pitschi, Franz-Xaver; and Linnerbauer, Horst, 4,880,949, Cl. 200-501.000.

Spittler, Joseph: *See—*
Andermann, Guy; Spittler, Joseph; Zilliox, Patricia; and Mergel, Dominique, 4,880,601, Cl. 422-28.000.

Spiveco, Inc.: *See—*
Spivey, James R.; and Dee, William J., 4,880,326, Cl. 401-123.000.

Spivey, Brett: *See—*
Korevaar, Eric J.; and Spivey, Brett, 4,881,068, Cl. 340-766.000.

Spivey, James R.; and Dee, William J., to Spiveco, Inc. Lipstick dispenser. 4,880,326, Cl. 401-123.000.

Sport Floor Design, Inc.: *See—*
Peterson, David L.; and Peterson, Michael J., 4,879,857, Cl. 52-403.000.

Sprague Aristo-Aire, Inc.: *See—*
Fasolino, Gabriel V., 4,880,031, Cl. 137-625.120.

Sprague, David L.; Harney, Kevin; Simon, Allen H.; and Taylor, Herbert H., Jr., to Intel Corporation. Stored-program controller for equalizing conditional branch delays. 4,881,194, Cl. 364-900.000.

Sprayberry, James M. Eyeletless fishing hook. 4,879,835, Cl. 43-44.830.

Springer, Albert R.: *See—*
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., 4,880,760, Cl. 502-67.000.

Stader, Harald: *See—*
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Albouy, Pierre; Le Gougnec, Robert; Nadaradjane, Ramatchandirane; Manca, Marcello; Mosca, Virgilio; and Nicastro, Antonio, 4,881,226, Cl. 370-110.100.

Stahler, Deborah L. Window shade assembly. 4,880,045, Cl. 160-84.100.

Staley, Charles M.; and Cornish, Verle E., to Aqua Process, Inc. Method and composition for the removal of ammonium salt and metal compound deposits. 4,880,568, Cl. 252-548.000.

Stamer, Hans. Process for manufacturing storable fruit preparations containing whole fruits. 4,880,648, Cl. 426-241.000.

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Kerkhoffs, Pieter L.; and Boesten, Wilhelmus H. J., 4,880,737, Cl. 435-106.000.
Teunissen, Antonius J. J. M.; Klop, Willem; and Delahaye, Hubertus J. A. V., 4,880,929, Cl. 544-242.000.

Stanadyne, Inc.: *See—*
Birman, Stephen P.; Smith, Richard B.; and Thompson, Richard L., 4,880,479, Cl. 148-320.000.

Stashko, Daniel R., to GTE Valenite Corporation. Cutting insert. 4,880,338, Cl. 407-114.000.

Stasko, William: *See—*
Dulis, Edward J.; Dorsch, Carl J.; and Stasko, William, 4,880,460, Cl. 75-236.000.

Stauffer Chemical Company: *See—*
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Steelcase Inc.: *See—*
Greene, David G., 4,880,218, Cl. 269-21.000.

Steele, David P., to NCR Corporation. Low noise output buffer circuit. 4,880,997, Cl. 307-443.000.

Steele, Raymond E., to Rapid Metal Developments Ltd. Load transmitting device. 4,880,204, Cl. 249-219.200.

Steer, Peter L.: *See—*
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Steiginga, Abe; and Worrall, Robert N., to Shell Oil Company. Assembly for directional drilling of boreholes. 4,880,066, Cl. 175-75.000.

Stein, Harvey L., to Hoechst Celanese Corporation. Composition and process for making porous articles from ultra high molecular weight polyethylene. 4,880,843, Cl. 521-98.000.

Stein, Mark M.: *See—*
Trainor, Diane A.; and Stein, Mark M., 4,880,780, Cl. 514-18.000.

Steiner, Herbert: *See—*
Nitzinger, Karl; Gerl, Josef; Steiner, Herbert; and Hess, Helmut, 4,880,955, Cl. 219-10.55R.

Stelman, David, to United States of America, Energy. Contactor/filter improvements. 4,880,608, Cl. 423-244.000.

Stenzel, Otto; Muller, Felix; Bruckmann, Gerhard; and Choudhury, Alok, to Leybold Aktiengesellschaft. Fault detection during remelt of electrodes into blocks. 4,881,239, Cl. 373-70.000.

Stephanopoulos, Gregory: *See—*
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Stephenson, Jerry D.: *See—*
Nakamura, Gary D.; and Stephenson, Jerry D., 4,880,050, Cl. 165-41.000.

Stermer, Philip E.: *See—*
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Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Millimeter wave microstrip nonreciprocal phase shifter. 4,881,052, Cl. 333-24.100.

Stewart, Albert J.: *See—*
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Stickney, Jay C.: *See—*
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Stienbarger, LeRoy: *See—*
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Stikeleather, Allan; and Blake, Geoffrey, to IBC Corporation. Connector for flexible electrical conduit. 4,880,387, Cl. 439-98.000.

Stinson, Larry A. Plastic hand lift pressure pump. 4,880,366, Cl. 417-555.100.

Stitchting Voor De Techische Wetenschappen: *See—*
Brakenhoff, Godefridus J., 4,880,294, Cl. 350-269.000.

Stitz, Albert: *See—*
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Stobb, Inc.: *See—*
Stobb, Walter J., 4,880,350, Cl. 414-790.200.

Stobb, Walter J., to Stobb, Inc. Method and apparatus for handling stacks of sheets. 4,880,350, Cl. 414-790.200.

Stockton, Warren D.: *See—*
Miller, Michael K.; and Stockton, Warren D., 4,879,829, Cl. 42-87.000.

Stockunas, Joseph: *See—*
Howells, Roger A.; Stoner, George H.; and Stockunas, Joseph, 4,880,162, Cl. 239-406.000.

Stone, James L., to Packaging Corporation of America. Collapsible foldable dispensing carton. 4,880,155, Cl. 229-125.090.

Stone, Kevin R. Prosthetic meniscus. 4,880,429, Cl. 623-18.000.

Stoner, George H.: *See—*
Howells, Roger A.; Stoner, George H.; and Stockunas, Joseph, 4,880,162, Cl. 239-406.000.

Stout, Gregg W.: *See—*
Nelson, John A.; and Stout, Gregg W., 4,880,056, Cl. 166-51.000.

Stow, Robert H., to Minnesota Mining and Manufacturing Company. Hot-tackifying adhesive tape. 4,880,683, Cl. 428-200.000.

Strangman, Thomas E.; and Solfest, Patricia A., to Allied-Signal Inc. Ceramic thermal barrier coating with alumina interlayer. 4,880,614, Cl. 428-623.000.

Strassheimer, Herbert, to Plasticon Patents, S.A. Method for preparing blow molded plastic container. 4,880,593, Cl. 264-532.000.

Stratz, Thomas: *See—*
Donnerhack, Andreas; Thoma, Klemens; Volker, Wolfgang; Stratz, Thomas; and Gallmeister, Rolf-Dieter, 4,880,003, Cl. 128-374.000.

Strein, Klaus: *See—*
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Stubbe, James S.; Chevalier, James L.; and Pow, Edwin C., to A. O. Smith Corporation. Cathodically protected water heater. 4,879,801, Cl. 29-455.100.

Studer, Franz: *See—*
von Arb, Hans-Peter; Durr, Ulrich; Gressly, Andre ; and Studer, Franz, 4,881,233, Cl. 372-35.000.

Stuecker, Erwin; and Roettger, Gerhard, to Siemens Aktiengesellschaft. Method of manufacturing turbine wheel disks with locally high internal compressive strains in the hub bore. 4,879,793, Cl. 29-156.80R.

Stuecker, Erwin; Hofer, Gerhard; Koch, Dietmar; and Guenes, Uenal, to Siemens Aktinegesellschaft. Method and apparatus for measuring and precisely locating internal tensile stresses in hardened regions of components by measuring coercive field strength and barkhausen noise amplitude. 4,881,030, Cl. 324-209.000.

Stuedemann, John A.: *See—*
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Sublette, Kerry L., to Combustion Engineering, Inc. Biofilter for the treatment of sour water. 4,880,542, Cl. 210-611.000.

Such, Christopher H.: *See—*
Abboud, George E.; Such, Christopher H.; Horley, Susan M.; and Waters, Julian A., 4,880,931, Cl. 544-316.000.

Suckow, William H., to J. M. Huber Corporation. Unitized instrument manifold. 4,879,912, Cl. 73-861.610.

Sugano, Yasuaki: *See—*
Urano, Wataru; and Sugano, Yasuaki, 4,880,892, Cl. 528-89.000.

Suganuma, Yuichiro: *See—*
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Sugi, Hideo: *See—*
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Sugie, Nizo: *See—*
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Sugihara, Hirosada; Itoh, Katsumi; and Nishikawa, Kohei, to Takeda Chemical Industries, Ltd. 1,4-disubstituted piperazines (or homopiperazines) as platelet-activating factor antagonists. 4,880,809, Cl. 514-255.000.

Sugimori, Teruhiko; Tajiri, Noriyuki; Suzuki, Fumio; Habara, Hideaki; Fukuda, Yutaro; and Sato, Haruki, to Mitsubishi Rayon Co., Ltd. Method for producing rubber modified thermoplastic resins. 4,880,877, Cl. 525-84.000.

Sugita, Noriyuki, to Electroplating engineers of Japan, Limited. Process and apparatus for recovery of precious metal compound. 4,880,511, Cl. 204-151.000.

Sugita, Yutaka: *See—*
Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, 4,880,694, Cl. 428-336.000.

Sugiyama, Haruki: *See—*
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Sugiyama, Hiroshi: *See—*
Tsuboi, Hiroyuki; and Sugiyama, Hiroshi, 4,881,186, Cl. 364-565.000.

Suissa, Moshe. Dry cleaning machine. 4,879,888, Cl. 68-18.00C.

Sukai, Emiko, to Kabushiki Kaisha Toshiba. Cushioning and protecting members. 4,880,214, Cl. 267-136.000.

Sullivan, James B.: *See—*
Osburn, Coy D.; and Sullivan, James B., 4,880,028, Cl. 137-315.000.

Sumi, Shigeo: *See—*
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Sumida, Hiroyasu, to Ricoh Company, Ltd. Device for setting operation modes of office equipment. 4,881,101, Cl. 355-204.000.

Sumida, Mamoru: *See—*
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Sumitomo Chemical Company, Limited: *See—*
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Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,880,925, Cl. 544-105.000.
Yamahira, Yoshiya; Okuzawa, Yoshiko; Fujioka, Keiji; Sato, Shigeji; and Ishikawa, Reimei, 4,880,796, Cl. 514-206.000.

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Sumitomo Electric Industries, Ltd.: *See*—
Itozaki, Hideo; Tanaka, Saburo; Fujita, Nobuhiko; Yazu, Shuji; and Jodai, Tetsuji, 4,880,773, Cl. 505-1.000.
Kanamori, Hiroo; Tanaka, Gotaro; Kyoto, Michihisa; Yoshioka, Naoki; and Mizutani, Futoshi, 4,880,452, Cl. 65-3.120.
Kohno, Yuichiro; and Hara, Akio, 4,880,707, Cl. 428-565.000.
Maeda, Naoki, 4,881,188, Cl. 364-713.000.
Satoh, Shyuichi; and Tsuji, Kazuwo, 4,880,613, Cl. 423-446.000.
Sumitomo Heavy Industries, Ltd.: *See*—
Keida, Yutaka, 4,880,372, Cl. 425-145.000.
Sumitomo Naugatuck Co., Ltd.: *See*—
Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, 4,880,874, Cl. 525-67.000.
Sumitomo Pharmaceuticals Company, Ltd.: *See*—
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Sun Electric Corporation: *See*—
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Sundqvist, Lars-Erik: *See*—
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Sundstrand Corporation: *See*—
Aarestad, Jerome K., 4,880,352, Cl. 415-182.100.
Niggemann, Richard E.; and Nguyen, Dam C., 4,880,055, Cl. 165-167.000.
Patel, Navinchandra R.; and Schwarz, Robert A., 4,881,001, Cl. 310-258.000.
Sundstrand Data Control, Inc.: *See*—
Norling, Brian L., 4,879,914, Cl. 73-862.590.
Sunkel, Carlos; Fay de Casa Juana, Miguel; Dorrego, Fernando; Pando, Basilio; Alvarez-Builla, Julio; Vaquero, Juan J.; Galera, Carlos; and Vazquez, Maria L., to Alter, S.A. Quaternary ammonium salts used as phase transfer catalyst. 4,880,894, Cl. 548-152.000.
Sunshine, Steven A.: *See*—
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Support Systems International, Inc.: *See*—
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Surakov, Anatoly M.: *See*—
Kanaljuk, Viktor L.; Surakov, Anatoly M.; Chornogotsky, Vasily M.; and Shifrin, Lazar N., 4,880,944, Cl. 174-138.00E.
Sutherland, Jack L.: *See*—
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Sutterlin, Wolfgang; and Defago, Raymond, to Ciba-Geigy Corporation. Process for aftertreating cellulosic materials printed with reactive dyes. 4,880,433, Cl. 8-182.000.
Suttner, Wolfgang. Valve pistol for a high pressure cleaning device. 4,880,166, Cl. 239-526.000.
Suzuki, Akira: *See*—
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Suzuki, Kazuhiro, to Nippon Cable System Inc. Operating device for transmission. 4,879,922, Cl. 74-500.500.
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Kito, Shozo; Harada, Shoichi; Imai, Hajime; Ohta, Hisatoshi; Suzuki, Masamitsu; and Muramatsu, Tadao, 4,880,092, Cl. 192-4.00A.
Suzuki, Masayuki: *See*—
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Swamikannu, A. Xavier, to UOP. Ultra-filtration membranes and a method for the separation of sugars using the same. 4,880,545, Cl. 210-654.000.
Swanson, Daniel G., Jr., to Avantek, Inc. Thin-film microwave filter. 4,881,050, Cl. 333-185.000.
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Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, to MTA Kozponti Kemiai Kutato Intezete and BIOGAL Gyogyszergyar. Topical process for treating herpes infections using 5-isopropyl-2'-β-deoxyuridine as the active agent. 4,880,785, Cl. 514-50.000.
Szarka, Ferencne : *See*—
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Szilard, John. Method of and apparatus for ultrasonic imaging. 4,880,010, Cl. 128-661.010.
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Szycher, Michael; and Rolfe, Jonathan L., to Thermedics, Inc. Perfume patch. 4,880,690, Cl. 428-224.000.
T.C., Inc.: *See*—
Coyne, Thomas J., Jr., 4,880,459, Cl. 75-35.000.
T W Kutter Inc.: *See*—
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TA Triumph-Adler Aktiengesellschaft: *See*—
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Tabohashi, Tatsuru; Sakurai, Takao; Higuchi, Ryoichi; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, to Ajinomoto Co., Inc. Optically active compound and liquid crystalline composition. 4,880,561, Cl. 252-299.610.
Tadokoro, Michihiro; Imai, Hitoshi; and Okada, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Optical reading or writing apparatus. 4,881,204, Cl. 369-46.000.
Tafte, Althea P.: *See*—
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Taga, Yutaka; and Kashihara, Yuji, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control system for automatic transmission, incorporating fail safe and progressive creep control and hill hold control. 4,879,925, Cl. 74-867.000.
Tagami, Shigeru: *See*—
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Taguchi, Takehiko: *See*—
Shibahara, Akihiro; Taguchi, Takehiko; Uehara, Akira; Shinohara, Koji; and Kawaguchi, Hiroshi, 4,880,318, Cl. 384-125.000.

Taguchi, Tetsu, to NEC Corporation. Encoder of a multi-pulse type capable of optimizing the number of excitation pulses and quantization level. 4,881,267, Cl. 381-40.000.

Tahara, Kazuo: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.

Tahara, Kenji: *See*—
Joukou, Isao; Sekikawa, Ayako; Sugi, Hideo; and Tahara, Kenji, 4,880,774, Cl. 512-2.000.

Tai, Akira: *See*—
Seto, Yutaka; Suzuki, Shigehiro; Suzuki, Tomohiro; Fujita, Atsushi; Tai, Akira; and Yoshino, Masahiro, 4,881,103, Cl. 355-251.000.

Taiho Industries Co., Ltd.: *See*—
Ohara, Sosaburo; Ikeda, Atsushi; Shinohara, Seigo; and Kijima, Tetsuo, 4,880,557, Cl. 252-174.150.

Tajima, Yo: *See*—
Urashima, Kazuhiro; Watanabe, Masakazu; Tajima, Yo; and Nakanishi, Kenji, 4,880,756, Cl. 501-97.000.

Tajiri, Noriyuki: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; Suzuki, Fumio; Habara, Hideaki; Fukuda, Yutaro; and Sato, Haruki, 4,880,877, Cl. 525-84.000.

Takacs, Tibor: *See*—
Resli, Istvan; Takacs, Tibor; Damjanovich, Sandor; Gaspar, Rezso; Tron, Lajos; Szollosi, Janos; and Matko, Janos, 4,880,732, Cl. 435-29.000.

Takada, Katsuhiro, to Olympus Optical Co., Ltd. Microscope objective. 4,880,298, Cl. 350-414.000.

Takadera, Ichiro: *See*—
Shinbori, Takeyoshi; Takadera, Ichiro; and Taguchi, Kohei, 4,880,213, Cl. 267-64.270.

Takagi, Kazuo: *See*—
Kato, Takeo; Kobayashi, Shingo; Takagi, Kazuo; Watanabe, Masahiro; and Kaneko, Kiyoshi, 4,881,173, Cl. 364-431.070.

Takago, Toshio; and Yamamoto, Yasushi, to Shin-Etsu Chemical Co., Ltd. Method for preparing a cyclic isocyanuric ester having organosilicon groups. 4,880,927, Cl. 544-193.000.

Takahashi, Eiji: *See*—
Ishida, Yasumasa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.

Takahashi, Fumitaka: *See*—
Yokouchi, Hisatake; Takahashi, Fumitaka; and Tsuneoka, Masayuki, 4,881,124, Cl. 358-111.000.

Takahashi, Hideo: *See*—
Sakamoto, Masashi; Okuda, Haruo; Takahashi, Hideo; and Yamada, Eiji, 4,880,703, Cl. 428-378.000.

Takahashi, Hiroaki: *See*—
Okamoto, Takeshi; Iwata, Mitsuo; and Takahashi, Hiroaki, 4,880,629, Cl. 424-678.000.

Takahashi, Jun: *See*—
Azuma, Makoto; Takahashi, Jun; Yamauchi, Hirohiko; and Ueda, Nobuo, 4,880,616, Cl. 424-1.100.

Takahashi, Kaoru: *See*—
Murata, Masahiro; and Takahashi, Kaoru, 4,880,579, Cl. 264-26.000.

Takahashi, Kenji: *See*—
Hosoi, Yuichi; and Takahashi, Kenji, 4,880,987, Cl. 250-484.100.

Takahashi, Kouji: *See*—
Sawamura, Masahiko; and Takahashi, Kouji, 4,879,954, Cl. 108-6.000.

Takahashi, Kyoko: *See*—
Matsushita, Hajime; Shibagaki, Makoto; and Takahashi, Kyoko, 4,880,937, Cl. 546-344.000.

Takahashi, Masatoshi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Hashimoto, Akihiro; Okita, Tsutomu; and Hanai, Kazuko, 4,880,692, Cl. 428-323.000.
Ryoke, Katsumi; Takahashi, Masatoshi; Hashimoto, Akihiro; Okita, Tsutomu; and Yoneyama, Takashi, 4,880,693, Cl. 428-323.000.

Takahashi, Shiro, to Man Design Co., Ltd. Fluid pressure regulating apparatus. 4,880,034, Cl. 138-40.000.

Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihiro, to Combi Co., Ltd. On-vehicle auxiliary seat for infant. 4,880,277, Cl. 297-467.000.

Takahashi, Toshiya: *See*—
Ohno, Kiyotaka; Takahashi, Toshiya; and Nishio, Shintaro, 4,880,939, Cl. 549-458.000.

Takai, Atsushi: *See*—
Imoto, Katsuyuki; Takase, Akihiko; Takai, Atsushi; Aoki, Satoshi; Yoshiya, Tsutomu; and Yamada, Shoji, 4,880,289, Cl. 350-96.180.

Takano, Hisashi: *See*—
Yuito, Isamu; Moriwaki, Eijin; Shiiki, Kazuo; Hamakawa, Yoshihiro; and Takano, Hisashi, 4,881,144, Cl. 360-125.000.

Takara Co., Ltd.: *See*—
Moriyama, Yasuyuki, 4,879,938, Cl. 84-95.200.

Takase, Akihiko: *See*—
Imoto, Katsuyuki; Takase, Akihiko; Takai, Atsushi; Aoki, Satoshi; Yoshiya, Tsutomu; and Yamada, Shoji, 4,880,289, Cl. 350-96.180.

Takatsu, Haruyoshi: *See*—
Sasaki, Makoto; Takeuchi, Kiyohumi; and Takatsu, Haruyoshi, 4,880,936, Cl. 546-339.000.

Takayama, Jun: *See*—
Isoguchi, Seiichi; Murai, Yoshio; Takayama, Jun; and Nagaishi, Katsuya, 4,881,127, Cl. 358-213.190.

Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, to Hitachi, Ltd. Magneto-optical recording material. 4,880,694, Cl. 428-336.000.

Takeda Chemical Industries Ltd.: *See*—
Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, 4,880,890, Cl. 528-45.000.
Miyabayashi, Shigeaki; Matsuura, Yoshikatsu; Kanai, Hiroshi; and Oka, Joji, 4,880,891, Cl. 528-45.000.
Sugihara, Hirosada; Itoh, Katsumi; and Nishikawa, Kohei, 4,880,809, Cl. 514-255.000.
Tsunemi, Yutaka; Asahi, Satoru; and Doi, Muneharu, 4,880,736, Cl. 435-87.000.

Takemoto Yushi Kabushiki Kaisha: *See*—
Minami, Hiroshi, 4,880,881, Cl. 525-438.000.

Takenaka, Toichi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 4,880,841, Cl. 514-654.000.

Takeuchi, Hajime: *See*—
Ito, Takeo; Takeuchi, Hajime; Hashimoto, Minoru; Fukaya, Toshio; and Koishi, Masumi, 4,880,666, Cl. 427-128.000.

Takeuchi, Kenichi; Saito, Shin; Araki, Shoji; and Nakayama, Atsushi, to Nippon Telegraph and Telephone Corporation; and Sony Corporation. Mis-detection of a video switchover key signal. 4,881,253, Cl. 379-54.000.

Takeuchi, Kiyohumi: *See*—
Sasaki, Makoto; Takeuchi, Kiyohumi; and Takatsu, Haruyoshi, 4,880,936, Cl. 546-339.000.

Takeuchi, Koji: *See*—
Tabohashi, Tatsuru; Sakurai, Takao; Higuchi, Ryoichi; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, 4,880,561, Cl. 252-299.610.

Takeuchi, Yasuhito, to Yokogawa Medical Systems, Limited. Ultrasonic transducer. 4,881,212, Cl. 367-152.000.

Taki, Naohiro; and Ozawa, Yasuhiro, to Asada Kabushiki Kaisha. Screw cutter die head. 4,880,340, Cl. 408-176.000.

Takigawa, Tomoya: *See*—
Kobayashi, Shigeyoshi; Yaba, Susumu; and Takigawa, Tomoya, 4,880,163, Cl. 239-422.000.

Takizawa, Sumio: *See*—
Hida, Tsuneo; Takizawa, Sumio; Ishii, Hakumi; Kegasa, Hideo; and Izawa, Minoru, 4,881,020, Cl. 318-626.000.

Talkington, Sherry R.: *See*—
Guffey, Timothy B.; Abe, Susan S.; Talkington, Sherry R.; and Mijac, Marko D., 4,880,657, Cl. 426-601.000.

Talus Corp.: *See*—
McClees, David L.; McClees, John S., Jr.; and McConnell, Michael P., 4,879,768, Cl. 2-268.000.

Tam, Man C.; Gundlach, Robert W.; and Pundsack, Arnold L., to Xerox Corporation. Imaging system. 4,880,715, Cl. 430-41.000.

Tamaki, Yoshiko: *See*—
Inagami, Yasuhiro; Nakagawa, Takayuki; Tamaki, Yoshiko; and Nagashima, Shigeo, 4,881,168, Cl. 364-200.000.

Tamborini, Giovanni: *See*—
Cavalleri, Bruno; Turconi, Marco; and Tamborini, Giovanni, 4,880,789, Cl. 514-183.000.

Tamoto, Katsumi; Ohuchi, Renzo; and Ono, Keiichi, to Sumitomo Pharmaceuticals Company, Ltd. Pyrrolidine derivatives having inhibitory action for proline specific endopepidase. 4,880,827, Cl. 514-423.000.

Tamura, Kazufumi: *See*—
Nakamura, Katsumi; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,795, Cl. 29-214.000.
Nakamura, Katsumi; Koide, Shigeyuki; Honda, Norio; Tamura, Kazufumi; and Kobayashi, Akifumi, 4,879,796, Cl. 29-214.000.

Tamura, Kimio: *See*—
Makino, Nobuhiko; Tamura, Kimio; Miyazaki, Hiroharu; Hosoda, Tomohiko; and Nakagawa, Fumio, 4,880,282, Cl. 303-116.000.

Tamura, Yasuyuki: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,881,084, Cl. 346-1.100.
Sato, Hiroshi; Tanaka, Kazumi; Kushida, Naoki; Katayama, Masato; Tamura, Yasuyuki; Hasegawa, Tetsuo; Yaegashi, Hisao; Kaneko, Shuzo; Tohma, Koichi; and Suzuki, Takayuki, 4,880,324, Cl. 400-241.000.

Tanaka, Akira; and Lee, Jimmy C.-M., to P. L. Porter Company. Mechanical linear lock with redundant locking feature. 4,880,084, Cl. 188-67.000.

Tanaka, Gotaro: *See*—
Kanamori, Hiroo; Tanaka, Gotaro; Kyoto, Michihisa; Yoshioka, Naoki; and Mizutani, Futoshi, 4,880,452, Cl. 65-3.120.

Tanaka, Hirotoshi: *See*—
Kinoshita, Taizo; Tanaka, Satoshi; Tanaka, Hirotoshi; Kotera, Nobuo; and Nagata, Minoru, 4,881,044, Cl. 330-253.000.

Tanaka, Hitoshi: *See*—
Obayashi, Shigeji; Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,880,888, Cl. 526-209.000.

Tanaka, Kazumi: *See*—
Sato, Hiroshi; Tanaka, Kazumi; Kushida, Naoki; Katayama, Masato; Tamura, Yasuyuki; Hasegawa, Tetsuo; Yaegashi, Hisao; Kaneko, Shuzo; Tohma, Koichi; and Suzuki, Takayuki, 4,880,324, Cl. 400-241.000.

Tanaka, Saburo: *See*—
Itozaki, Hideo; Tanaka, Saburo; Fujita, Nobuhiko; Yazu, Shuji; and Jodai, Tetsuji, 4,880,773, Cl. 505-1.000.
Tanaka, Satoshi: *See*—
Kinoshita, Taizo; Tanaka, Satoshi; Tanaka, Hirotoshi; Kotera, Nobuo; and Nagata, Minoru, 4,881,044, Cl. 330-253.000.
Tanaka, Shigenobu; and Arai, Tomohisa, to NEC Corporation. Apparatus for controlling peripheral equipment. 4,881,169, Cl. 364-200.000.
Tanaka, Shinya: *See*—
Soma, Masahiro; and Tanaka, Shinya, 4,881,065, Cl. 340-710.000.
Tanaka, Takashi; Sano, Takezo; and Shimizu, Tsutomu, to Omron Tateisi Electronics Co. Electromagnetic relay. 4,881,053, Cl. 335-80.000.
Tanaka, Yuji: *See*—
Yamazaki, Hiroshi; Hara, Toshiyuki; Tanaka, Yuji; and Mouri, Takayuki, 4,880,264, Cl. 292-226.000.
Tang, Wai-Cheung; Cameron, Richard J.; and Bryant, David M. T., to Com Dev Ltd. Dielectric image-resonator multiplexer. 4,881,051, Cl. 333-208.000.
Tani, Mayumi: *See*—
Aoki, Masaaki; Tani, Mayumi; Kamiyama, Masayuki; and Asai, Kiyotsugu, 4,880,869, Cl. 524-773.000.
Taniguchi, Susumu: *See*—
Suzuki, Tsutomu; Seko, Tatsushi; Tobita, Kuniharu; Matsubayashi, Saburo; Kougo, Nobuhiko; Ogawa, Kiyoshi; Taniguchi, Susumu; Minami, Masaharu; Hayakawa, Masayuki; and Kawada, Noriyuki, 4,879,788, Cl. 26-94.000.
Tanimori, Shigeru: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,880,857, Cl. 523-205.000.
Tank, Klaus. Brazing. 4,880,154, Cl. 228-122.000.
Tardy, Maurice; and Marcon, Louis, to Bennes Marrel, Zone Industrielle Sud. Hydraulic control valve. 4,879,944, Cl. 91-516.000.
Tarnow, Ferdinand: *See*—
Knoblauch, Karl; Tarnow, Ferdinand; and Heimbach, Heinrich, 4,880,765, Cl. 502-432.000.
Tateishi, Fusao: *See*—
Inoue, Kazuo; Kubota, Osamu; Yano, Shunji; Tateishi, Fusao; Noda, Etsuo; Yamaguchi, Koji; and Endo, Tsuneo, 4,880,351, Cl. 415-164.000.
Tatsuda, Tokuo: *See*—
Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, 4,880,874, Cl. 525-67.000.
Tatung Company of America: *See*—
Fu, Cheun-Yuan, 4,880,594, Cl. 361-383.000.
Taurus Gumiipari Vallalat: *See*—
Palotas, Laszlo ; Laszlo, Geza; Horvath, Lazlo; Baria, Arpadne ; Marion, Barnabas; and Szarka, Ferencne , 4,880,208, Cl. 251-356.000.
Taylor, Atalee S.: *See*—
Dawson, Andrew J., Jr.; Farrar, John C.; Pirc, Douglas J.; and Taylor, Atalee S., 4,880,397, Cl. 439-620.000.
Taylor, Gordon J. Brake cam shaft attachment apparatus. 4,880,085, Cl. 188-79.550.
Taylor, Herbert H., Jr.: *See*—
Sprague, David L.; Harney, Kevin; Simon, Allen H.; and Taylor, Herbert H., Jr., 4,881,194, Cl. 364-900.000.
Tazaki, Satoru; and Yoshioka, Yasuhiro, to Clarion Co., Ltd. FM multipath noise reduction circuit. 4,881,274, Cl. 455-296.000.
TDK Corporation: *See*—
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, 4,880,687, Cl. 428-141.000.
TDW Delaware, Inc.: *See*—
Osburn, Coy D.; and Sullivan, James B., 4,880,028, Cl. 137-315.000.
Technip Geoproduction: *See*—
Thomas, Pierre-Armand; and Grundman, Raphael, 4,880,336, Cl. 405-198.000.
Tecma Laboratories: *See*—
Trenzeluk, Theodore, 4,880,627, Cl. 424-640.000.
Tekamp-Olson, Patricia: *See*—
Burke, Rae L.; Rosenberg, Steven; Shuster, Jeffrey R.; Tekamp-Olson, Patricia; Valenzuela, Pablo D. T.; and Barr, Philip J., 4,880,734, Cl. 435-68.000.
Telediffusion de France: *See*—
Pommier, Daniel; and Alard, Michel, 4,881,241, Cl. 375-38.000.
Telefind Corp.: *See*—
Andros, Andrew A.; and Campana, Thomas J., Jr., 4,881,073, Cl. 340-825.440.
TenBrink, Ruth E.: *See*—
Hester, Jackson B., Jr.; Thaisrivongs, Suvit; Sawyer, Tomi K.; TenBrink, Ruth E.; Saneii, Hossain H.; Schostarez, Heinrich J.; and Pals, Donald T., 4,880,781, Cl. 514-18.000.
Tengler, Harvey N.: *See*—
Hall, Garth O.; and Tengler, Harvey N., 4,880,201, Cl. 248-575.000.
Tenud, Leander: *See*—
Muel, Thomas; Tenud, Leander; Duc, Laurent; and McGarrity, John, 4,880,940, Cl. 548-544.000.
Teot, Arthur S.: *See*—
Rose, Gene D.; Teot, Arthur S.; and Seymour, Keith G., 4,880,565, Cl. 252-355.000.
Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Komori, Shinji; Shima, Kenji; Miyata, Souichi; Matsumoto, Satoshi; Asano, Hajime; Shimizu, Masahisa; and Miura, Hiroki, to Mitsubishi Denki Kabushiki Kaisha; Sharp Kabushiki Kaisha; Matsushita Electric Industrial Co., Ltd.; and Sanyo Electric Co., Ltd. Data transmission line branching system. 4,881,196, Cl. 364-900.000.
Terada, Matsuaki: *See*—
Sasaki, Hisao; Terada, Matsuaki; Matsui, Susumu; Kawakita, Kenji; Kashio, Jiro; Baba, Shiro; Akao, Yasushi; and Okochi, Toshio, 4,881,167, Cl. 364-200.000.
Teramachi, Hiroshi. Angular contact linear slide bearing. 4,880,317, Cl. 384-45.000.
Teranishi, Mitsuo; Urushidani, Haruo; Toriya, Hajime; and Ebine, Shoji, to Hitachi, Ltd.; and Hitachi Power Engineering Co., Ltd. Warming structure of gas turbine rotor. 4,880,354, Cl. 416-95.000.
Terasawa, Masaaki: *See*—
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,881,201, Cl. 365-189.090.
Terauchi, Kiyoshi; and Hiraga, Masaharu, to Sanden Corporation. Variable displacement compressor with biased inclined member. 4,880,360, Cl. 417-222.000.
Termine, Enrico J.; Faystritsky, Nicolai A.; and Borden, Dennis M., to Great Lakes Chemical Corporation. Flame retardant ABS resin composition. 4,880,862, Cl. 524-373.000.
Terneu, Robert: *See*—
Thomas, Jean-Francois; Terneu, Robert; Van Cauter, Albert; and Van Laethem, Robert, 4,880,698, Cl. 428-333.000.
Terry, Paul E. Safety flow control fluid shutoff device. 4,880,030, Cl. 137-460.000.
Terui, Nobuhiko; Kusaka, Yosuke; Shiokama, Yoshiharu; and Sasagaki, Nobuaki, to Nikon Corporation. Lens interchange type single-lens reflex camera system and intermediate barrel therefor. 4,881,094, Cl. 354-286.000.
Terumo Kabushiki Kaisha: *See*—
Okamoto, Takeshi; Iwata, Mitsuo; and Takahashi, Hiroaki, 4,880,629, Cl. 424-678.000.
Teunissen, Antonius J. J. M.; Klop, Willem; and Delahaye, Hubertus J. A. V., to Stamicarbon B.V. Process for preparing a 2-alkyl-1,4,5,6-tetrahydropyrimidine. 4,880,929, Cl. 544-242.000.
Texaco Inc.: *See*—
Den Bleyker, Alfred L., 4,880,438, Cl. 48-69.000.
Najjar, Mitri S.; and Robin, Allen M., 4,880,439, Cl. 48-197.00R.
Texas Instruments Incorporated: *See*—
Tomkinson, Donald; and D'Entremont, John R., 4,879,805, Cl. 29-622.000.
Wallace, Barry M.; and Fasolino, Ross, 4,879,814, Cl. 33-234.000.
Textron, Inc.: *See*—
Hayes, William J.; Matrone, Harry A.; and Johnson, Philip D., 4,880,477, Cl. 148-141.000.
Tezuka, Tokuya: *See*—
Kijima, Toshio; Tezuka, Tokuya; Doi, Yoji; Yamashita, Shuiichi; Namba, Shigetoh; and Arie, Tsutomu, 4,880,745, Cl. 435-253.300.
Th. Goldschmidt AG: *See*—
Esselborn, Eberhard; and Fock, Jurgen, 4,880,906, Cl. 528-403.000.
Thaisrivongs, Suvit: *See*—
Hester, Jackson B., Jr.; Thaisrivongs, Suvit; Sawyer, Tomi K.; TenBrink, Ruth E.; Saneii, Hossain H.; Schostarez, Heinrich J.; and Pals, Donald T., 4,880,781, Cl. 514-18.000.
Theis, Clarence F.: *See*—
Miller, George W.; and Theis, Clarence F., 4,880,443, Cl. 55-26.000.
Theisen, Dieter: *See*—
Hartel, Volker; Theisen, Dieter; and Oppermann, Gunter, 4,880,216, Cl. 267-140.100.
Theobald, Hans: *See*—
Kolassa, Dieter; Keil, Michael; Schirmer, Ulrich; Theobald, Hans; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,880,456, Cl. 71-88.000.
Thermacore, Inc.: *See*—
Meyer, George A., IV; and Coleman, Robert F., 4,880,052, Cl. 165-104.140.
Thermalloy Incorporated: *See*—
Hinshaw, Howard G., 4,879,891, Cl. 72-254.000.
Thermedics, Inc.: *See*—
Szycher, Michael; and Rolfe, Jonathan L., 4,880,690, Cl. 428-224.000.
Theuer, Rudolf: *See*—
Nowak, Gerhard; Kruschik, Klaus; Morbitzer, Hans P.; Theuer, Rudolf; and Winter, Alfred, 4,880,252, Cl. 280-618.000.
Thobe, Clemens: *See*—
Lauermann, Georg; and Thobe, Clemens, 4,880,639, Cl. 426-2.000.
Thoma, Klemens: *See*—
Donnerhack, Andreas; Thoma, Klemens; Volker, Wolfgang; Stratz, Thomas; and Gallmeister, Rolf-Dieter, 4,880,003, Cl. 128-374.000.
Thomas, Arthur K., to ICI Americas Inc. Heat resistant high modulus reaction injection molding (RIM) polymers, blends used in the production thereof and a process for producing the same. 4,880,872, Cl. 525-43.000.
Thomas, Jean-Francois; Terneu, Robert; Van Cauter, Albert; and Van Laethem, Robert, to Glaverbel. Coated flat glass. 4,880,698, Cl. 428-333.000.
Thomas, Jean-Francois: *See*—
Hecq, Andre ; and Thomas, Jean-Francois, 4,880,677, Cl. 428-38.000.
Thomas, Jeffrey A.; Robinson, Theodore S.; Ertl, Robert A.; and Christensen, Harold F., r., to Amdahl Corporation. Computer system architecture employing cache data line move-out queue buffer. 4,881,163, Cl. 364-200.000.
Thomas, Pierre-Armand; and Grundman, Raphael, to Technip Geoproduction; and Engrenages et Reducteurs Citroen-Messian-Durand.

Suspension device for the support legs of a jack-up oil platform. 4,880,336, Cl. 405-198.000.
Thompson, Frederick N., Jr.: *See*—
Lipham, Luke B.; Stuedemann, John A.; and Thompson, Frederick N., Jr., 4,880,632, Cl. 424-425.000.
Thompson, Glenn R.; and Breitbart, Yuri J., to Amoco Corporation. Method for consistent multidatabase transaction processing. 4,881,166, Cl. 364-200.000.
Thompson Hybrides et Microondes: *See*—
Tung, Pham N., 4,881,046, Cl. 330-277.000.
Thompson, Marion L., deceased (by Campbell, Collene, executor), to Mickey Thompson Entertainment Group. Deceleration apparatus and method for stopping a racing vehicle. 4,880,083, Cl. 188-2.00R.
Thompson, Murray A., to Wisconsin Alumni Research Foundation. Stepping motor control. 4,881,161, Cl. 364-167.010.
Thompson, Richard L.: *See*—
Birman, Stephen P.; Smith, Richard B.; and Thompson, Richard L., 4,880,479, Cl. 148-320.000.
Thomson-Brandt Armements: *See*—
Repe, Thouron; and Francois, Denis J., 4,879,941, Cl. 89-1.140.
Thomson-CSF: *See*—
Auneau, Gisele; and Boulanger, Alain, 4,881,048, Cl. 331-14.000.
Chautemps, Jacques; and Vidal, Andre , 4,881,249, Cl. 377-60.000.
Vatoux, Sylvie; Papuchon, Michel; and Lefevre, Herve , 4,880,288, Cl. 350-96.120.
Thorn EMI PLC: *See*—
Shaw, John E. A.; and Webb, Brian C., 4,879,904, Cl. 73-517.00R.
Thorp, Phil D.: *See*—
Willoughby, Robert; and Thorp, Phil D., 4,880,064, Cl. 173-12.000.
Thorpe, Philip E., to ICRF (Patents) Limited. Heterobifunctional linking agents derived from N-succinimido-dithio-alpha methyl-methylene-benzoates. 4,880,935, Cl. 546-281.000.
Threlkeld, Trina A. Shark diverting apparatus. 4,879,833, Cl. 43-26.100.
Thukakoshi, Thuneo: *See*—
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,881,120, Cl. 357-23.400.
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, to Societe Anonyme dite: Alsthom. High-or medium-tension compressed-gas circuit breaker taking circuit-breaking energy from the arc. 4,880,946, Cl. 200-148.00A.
Tillman, Ennis L.; and Caldwell, James R., to Whirlpool Corporation. Vacuum cleaner wand release structure. 4,880,258, Cl. 285-7.000.
Ting, Albert C.; Willis, Timothy R.; Christ, F. Richard; Bacich, Steven R.; Pettit, Dean K.; Van Gent, Stanley L.; and Day, Jeffrey C., to Allergan, Inc. Haptic to optic attachment for a soft IOL. 4,880,426, Cl. 623-6.000.
TMC Corporation: *See*—
Nowak, Gerhard; Kruschik, Klaus; Morbitzer, Hans P.; Theuer, Rudolf; and Winter, Alfred, 4,880,252, Cl. 280-618.000.
Tobe, Akihiro: *See*—
Ninomiya, Kunihiro; Saito, Ken-Ichi; Morita, Shuji; Tobe, Akihiro; and Nitta, Isei, 4,880,819, Cl. 514-316.000.
Toben, Michael P.; Brown, Neil D.; Esterl, David J.; and Schetty, Robert A., to LeaRonal, Inc. Tin, lead or tin/lead alloy electrolytes for high speed electroplating. 4,880,507, Cl. 204-44.400.
Tobita, Hideaki: *See*—
Yomogida, Toshihiko; Yamashita, Tsuyoshi; Yamamoto, Shigeo; Tobita, Hideaki; Nakamura, Hisanori; and Kobayashi, Goro, 4,881,220, Cl. 370-16.000.
Tobita, Kuniharu: *See*—
Suzuki, Tsutomu; Seko, Tatsushi; Tobita, Kuniharu; Matsubayashi, Saburo; Kougo, Nobuhiko; Ogawa, Kiyoshi; Taniguchi, Susumu; Minami, Masaharu; Hayakawa, Masayuki; and Kawada, Noriyuki, 4,879,788, Cl. 26-94.000.
Tochigi Prefecture: *See*—
Kijima, Toshio; Tezuka, Tokuya; Doi, Yoji; Yamashita, Shuiichi; Namba, Shigetoh; and Arie, Tsutomu, 4,880,745, Cl. 435-253.300.
Todaro, George J.: *See*—
Cornelius, Paul A.; Hochstrasser, Robin M.; Kallenbach, Neville R.; Rubin, Harvey; and Todaro, George J., 4,880,512, Cl. 204-157.610.
Toft, Howard C.: *See*—
Graves, William H., Jr.; Wallace, Gary W.; Bradford, Bruce P.; Carpenter, Carolyn R.; Smith, Kenneth W.; and Toft, Howard C., 4,880,018, Cl. 131-375.000.
Tohma, Koichi: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,881,084, Cl. 346-1.100.
Sato, Hiroshi; Tanaka, Kazumi; Kushida, Naoki; Katayama, Masato; Tamura, Yasuyuki; Hasegawa, Tetsuo; Yaegashi, Hisao; Kaneko, Shuzo; Tohma, Koichi; and Suzuki, Takayuki, 4,880,324, Cl. 400-241.000.
Yaegashi, Hisao; Hasegawa, Tetsuo; Kushida, Naoki; Tohma, Koichi; and Suzuki, Takayuki, 4,880,686, Cl. 428-212.000.
Tohyama, Noboru: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,881,084, Cl. 346-1.100.
Tojo, Yoshikazu: *See*—
Nishigaki, Shinichi; Nakamura, Takeaki; Yoshinaga, Jun; Kanno, Masahide; Yabe, Hisao; Yokoi, Takeshi; Oozeki, Kazuhiko; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,879,992, Cl. 128-6.000.
Tokai Rubber Industries, Ltd.: *See*—
Katayama, Motohiro; and Suzuki, Tatsuya, 4,880,215, Cl. 267-140.100.
Shibahara, Akihiro; Taguchi, Takehiko; Uehara, Akira; Shinohara, Koji; and Kawaguchi, Hiroshi, 4,880,318, Cl. 384-125.000.
Tokai TRW & Co., Ltd.: *See*—
Sakai, Motohiro, 4,880,329, Cl. 403-134.000.
Tokita, Kiyoshi: *See*—
Inoue, Masatsugu; Tokita, Kiyoshi; Sone, Toshinao; Fujiwara, Takeshi; and Nakane, Kazunori, 4,881,004, Cl. 313-408.000.
Tokunoh, Futoshi: *See*—
Niwayama, Kazuhiko; Nakagawa, Tsutomu; Tokunoh, Futoshi; and Yoshida, Shigekazu, 4,881,118, Cl. 357-79.000.
Tokura, Koichi; and Matsui, Goro, to Risho Kogyo Co., Ltd. Molded capacitor. 4,881,149, Cl. 361-328.000.
Tokyo Electric Power Co., Ltd., The: *See*—
Ishida, Yasumasa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.
Tokyo Keiki Co., Ltd.: *See*—
Hojo, Takeshi; Yamamoto, Kanshi; Kawada, Shinichi; Murabayashi, Kazushige; Akimoto, Mamoru; and Fukano, Michio, 4,879,918, Cl. 74-5.470.
Tokyo Seikan Kaisha, Ltd.: *See*—
Yamada, Morio; and Kimura, Yoshihiko, 4,880,041, Cl. 141-167.000.
Tolan, Peter J. Air blast generator. 4,880,147, Cl. 222-195.000.
Tolle, Karl-Heinz; Heinemann, Heinz-Walter; Brockhaus, Jurgen; and Fiebrich, Wolfgang, to ED. Scharwachter GmbH & Co. KG. Swivel bearing for a door-holding rod for a door-holding device for motor vehicles. 4,879,785, Cl. 16-82.000.
Tolman, Richard L.: *See*—
Ashton, Wallace T.; Canning, Laura F.; Field, Arthur K.; and Tolman, Richard L., 4,880,820, Cl. 514-322.000.
Tombolato, Aldo L.: *See*—
Evans, Neil L.; Tombolato, Aldo L.; Reynolds, Robert R.; and Meisner, Robert J., 4,880,104, Cl. 198-445.000.
Tomita, Ken; and Mori, Seiichiro, to JEOL Ltd. Analytical electron microscope. 4,880,977, Cl. 205-311.000.
Tomizawa, Akira: *See*—
Ushio, Jiro; Miyazawa, Osamu; Yokono, Hitoshi; and Tomizawa, Akira, 4,880,464, Cl. 106-1.050.
Tomizu, Motoyuki: *See*—
Shima, Koichi; and Tomizu, Motoyuki, 4,880,401, Cl. 439-746.000.
Tomkinson, Donald; and D'Entremont, John R., to Texas Instruments Incorporated. Method for making a circuit interrupter device. 4,879,805, Cl. 29-622.000.
Tomlinson, Peter N. Cutting tool for a mining machine. 4,880,278, Cl. 299-79.000.
Tone, Shoichi: *See*—
Yamauchi, Tosio; Tone, Shoichi; and Ueda, Yutaka, 4,880,175, Cl. 242-35.50R.
Toray Industries: *See*—
Ohno, Kiyotaka; Takahashi, Toshiya; and Nishio, Shintaro, 4,880,939, Cl. 549-458.000.
Toray Silicone Company, Ltd.: *See*—
Morita, Yoshitsugu; Yokoyama, Noriyasu; and Yoshida, Keiji, 4,880,882, Cl. 525-446.000.
Torichigai, Masaaki: *See*—
Maeyama, Takuzo; Nii, Kenichi; Shimojo, Shigeru; Iwamoto, Keiichi; Torichigai, Masaaki; and Koizumi, Kiyoshi, 4,879,973, Cl. 122-379.000.
Toriya, Hajime: *See*—
Teranishi, Mitsuo; Urushidani, Haruo; Toriya, Hajime; and Ebine, Shoji, 4,880,354, Cl. 416-95.000.
Tork, Leo; Vogt, Hans-Gunter; and Heins, Ferdinand, to Bayer Aktiengesellschaft. Acrylate binder and its use for dressing leather. 4,880,673, Cl. 427-412.000.
Toshiba Glass Co., Ltd.: *See*—
Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, 4,880,986, Cl. 250-484.100.
Toshiba Kikai Kabushiki Kaisha: *See*—
Tsuboi, Hiroyuki; and Sugiyama, Hiroshi, 4,881,186, Cl. 364-565.000.
Touchi, Hachiro: *See*—
Murakami, Koji; Higeta, Kazuya; and Touchi, Hachiro, 4,881,185, Cl. 364-557.000.
Toyama, Tadao; Ohba, Hisao; and Kunichika, Kenji, to Fuji Photo Film Co., Ltd. Method for manufacture of lithographic printing plate with disposable developer with surfactant. 4,880,724, Cl. 430-302.000.
Toyo Flocking Co.: *See*—
Haranoya, Tomoji; Motegi, Toshio; and Abe, Masaaki, 4,879,969, Cl. 118-638.000.
Toyoda Gosei Co., Ltd.: *See*—
Nagata, Atsushi, 4,879,923, Cl. 74-552.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Yomogida, Toshihiko; Yamashita, Tsuyoshi; Yamamoto, Shigeo; Tobita, Hideaki; Nakamura, Hisanori; and Kobayashi, Goro, 4,881,220, Cl. 370-16.000.
Toyoshima, Hisanori: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Asada, Toshiyuki; Kubo, Seitoku; Nakamura, Shinya; Kinoshita, Masafumi; and Kuroda, Takaaki, 4,879,921, Cl. 74-467.000.
Hida, Tsuneo; Takizawa, Sumio; Ishii, Hakumi; Kegasa, Hideo; and Izawa, Minoru, 4,881,020, Cl. 318-626.000.
Kito, Shozo; Harada, Shoichi; Imai, Hajime; Ohta, Hisatoshi; Suzuki, Masamitsu; and Muramatsu, Tadao, 4,880,092, Cl. 192-4.00A.
Taga, Yutaka; and Kashihara, Yuji, 4,879,925, Cl. 74-867.000.

Toyota Jidosha Kabushiki Kiahsa: *See*—
Yomogida, Toshihiko; Yamashita, Tsuyoshi; Yamamoto, Shigeo; Tobita, Hideaki; Nakamura, Hisanori; and Kobayashi, Goro, 4,881,220, Cl. 370-16.000.

Traber, Jorg: *See*—
Schohe, Rudolf; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,880,802, Cl. 514-222.200.

Tracy, Stephen E. Toy air vehicle. 4,880,071, Cl. 180-117.000.

Trainor, Diane A.; and Stein, Mark M., to ICI Americas Inc. Selected difluoro derivatives. 4,880,780, Cl. 514-18.000.

Tramont, Charles V. Obstetric safety device. 4,880,418, Cl. 604-356.000.

Trankle, Richard. Portable tape dispenser unit. 4,880,152, Cl. 224-162.000.

Trasen, Benjamin: *See*—
Haraveth, Garry R.; Catterfeld, Robert J.; and Trasen, Benjamin, 4,880,536, Cl. 210-232.000.

Tredegar Industries, Inc.: *See*—
McBride, Robert K., 4,880,422, Cl. 604-389.000.

Trek-Tron Coolers Inc.: *See*—
Hartwick, L. Paul, 4,881,024, Cl. 323-299.000.

Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Sands, Keith P., 4,880,640, Cl. 426-3.000.

Trenzeluk, Theodore, to Tecma Laboratories. Skin therapeutic mixture containing eupatorium extract and formulations. 4,880,627, Cl. 424-640.000.

Treybig, Duane S.; and Motes, John M., to Dow Chemical Company, The. Preparation of hydroxyalkylpiperazinones by reacting a 2,3-dihydroxy-1,4-dioxane with a hydroalkyldiamine. 4,880,934, Cl. 544-384.000.

Trhlik, Jiri: *See*—
Kubata, Milan; Soukup, Jiri; and Trhlik, Jiri, 4,880,183, Cl. 242-125.100.

Triguero, Felix O. Intake and exhaust system through rotatory ports shaft, in four-stroke motors. 4,879,979, Cl. 123-190.0BB.

Tripp, Kenneth C. Apparatus for maintaining soil moisture. 4,879,852, Cl. 52-169.500.

Tron, Lajos: *See*—
Resli, Istvan; Takacs, Tibor; Damjanovich, Sandor; Gaspar, Rezso; Tron, Lajos; Szollosi, Janos; and Matko, Janos, 4,880,732, Cl. 435-29.000.

TRW Canada, Ltd.: *See*—
Polkinghorne, John, 4,879,878, Cl. 62-187.000.

TRW, Inc.: *See*—
Jones, Robert J.; and Chang, Glenn E. C., 4,880,584, Cl. 264-135.000.
Rourke, Kenneth H.; and Hart, Raymond J., 4,880,187, Cl. 244-172.000.

Tsai, Boh C.: *See*—
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.

Tsay, Shern-Ji: *See*—
Chen, Hong-Bin; Chang, Lien-Kuei; Tsay, Shern-Ji; Chou, Tung-Sheng; and Shiue, Fong, 4,879,905, Cl. 73-579.000.

Tseng, Su; and Chien, Wan S. Illuminating umbrella handle. 4,881,154, Cl. 362-102.000.

Tsuboi, Hiroyuki; and Sugiyama, Hiroshi, to Toshiba Kikai Kabushiki Kaisha. Apparatus for measuring injection speed of die cast machines. 4,881,186, Cl. 364-565.000.

Tsuboi, Shinichi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; and Shibuya, Katsuhiko, 4,880,933, Cl. 544-332.000.

Tsuchida, Masumi: *See*—
Semura, Norio; Tsuchida, Masumi; and Shimamura, Yoshihiro, 4,879,803, Cl. 29-598.000.

Tsuji, Kazuwo: *See*—
Satoh, Shyuichi; and Tsuji, Kazuwo, 4,880,613, Cl. 423-446.000.

Tsujimoto, Jun-ichi; Matsui, Masataka; Iwai, Hiroshi; and Ohtani, Takayuki, to Kabushiki Kaisha Toshiba. Semiconductor memory device using partial decoders for redundancy. 4,881,202, Cl. 365-200.000.

Tsukamoto, Nobuo: *See*—
Yamauchi, Yukiji; Tsukamoto, Nobuo; and Koya, Masahiro, 4,881,271, Cl. 455-56.000.

Tsunemi, Yutaka; Asahi, Satoru; and Doi, Muneharu, to Takeda Chemical Industries, Ltd. Production of uridine. 4,880,736, Cl. 435-87.000.

Tsuneoka, Masayuki: *See*—
Yokouchi, Hisatake; Takahashi, Fumitaka; and Tsuneoka, Masayuki, 4,881,124, Cl. 358-111.000.

Tsuruda, Takahiro: *See*—
Matsunami, Hidenobu; Tsuruda, Takahiro; Hitosugi, Naoki; and Hirukawa, Yoshinori, 4,880,644, Cl. 426-46.000.

Tsurumi, Hideaki: *See*—
Fujiwara, Toshihiro; Tsurumi, Hideaki; and Sato, Yukio, 4,880,926, Cl. 544-105.000.

Tsuruoka, Yoshihisa, to Futaba Denshi Kogyo Kabushiki Kaisha. Display device with stretched electrode assemblies having different resonant frequencies. 4,881,017, Cl. 313-495.000.

Tua Espallargas, Antonio, to Fabricacion De Herramientas Y. Utensilios, S.A. Machine cutter. 4,880,337, Cl. 407-40.000.

Tucker, Howard, to Imperial Chemical Industries PLC. Acyanilide derivatives. 4,880,839, Cl. 514-613.000.

Tudos nee Feuer, Helga: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.

Tufts, Timothy A.; Bock, Robert S.; and Moss, Christopher T., to Ashland Oil, Inc. Thermoset molding compositions catalyzed by 1,4-benzoquinone salts of 1,8-diaza-bicyclo(5.4.0)undec-7-ene. 4,880,846, Cl. 521-129.000.

Tufts, Timothy A.: *See*—
Moss, Christopher T.; Tufts, Timothy A.; and Bock, Robert S., 4,880,845, Cl. 521-114.000.

Tukamoto, Hirosi: *See*—
Kato, Yoji; Minai, Oaamu; Tukamoto, Hirosi; Hagiwara, Takashi; and Kosaka, Katsuji, 4,881,018, Cl. 318-9.000.

Tung, Pham N., to Thompson Hybrides et Microondes. Microwave linear amplifier with very wide pass band. 4,881,046, Cl. 330-277.000.

Tunstall Telecom Limited: *See*—
Jones, David; and Abbott, David I., 4,881,252, Cl. 379-38.000.

Turconi, Marco: *See*—
Cavalleri, Bruno; Turconi, Marco; and Tamborini, Giovanni, 4,880,789, Cl. 514-183.000.

Turner, Clifford B.: *See*—
Menard, Alan W.; and Turner, Clifford B., 4,879,846, Cl. 51-137.000.

Tutumi, Kazumichi, to Mitisubishi Denki Kabushiki Kaisha. Suction air measuring device. 4,879,908, Cl. 73-861.230.

Tweedy, Mark; and McCoy, Gary, to Carl Strutz & Company, Inc. Adjustable workpiece rotating device. 4,880,100, Cl. 198-379.000.

Twyman, Diana L.: *See*—
Zarowitz, Barbara J.; and Twyman, Diana L., 4,880,014, Cl. 128-734.000.

Tyo, Eileen M.: *See*—
Kaukeinen, Joseph Y.; and Tyo, Eileen M., 4,880,494, Cl. 156-633.000.

Uarco Incorporated: *See*—
Zehner, George F., Jr., 4,880,255, Cl. 282-11.50A.

Ube Industries, Ltd.: *See*—
Sasakawa, Shigeru; and Shiba, Masayuki, 4,880,786, Cl. 514-53.000.

Uchida, Hiroshi: *See*—
Matsui, Isamu; Uchida, Hiroshi; Otojima, Hirao; and Kino, Yoshihiro, 4,880,176, Cl. 242-35.60E.

Uchida, Manabu: *See*—
Kitano, Kisei; Uchida, Manabu; Ushioda, Makoto; and Suzuki, Toshiharu, 4,880,562, Cl. 252-299.630.

Uchida, Minoru; Morita, Seiji; Chihiro, Masatoshi; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Imidazopyridylalkylthio-pyridines and anti-peptic ulcer compositions containing the same. 4,880,815, Cl. 514-303.000.

Uchida, Norimasa, to Hitachi Metals, Ltd. Super hard high-speed tool steel. 4,880,461, Cl. 75-238.000.

Uchida, Shinya; Kohzu, Kazuya; Fujii, Kiyoshi; and Kawakami, Moriatsu, to Laurel Bank Machines Co., Ltd. Paper money discriminator. 4,881,268, Cl. 382-7.000.

Uchida, Shunsuke: *See*—
Matsuda, Masami; Funabashi, Kiyomi; Nishi, Takashi; Komori, Itaru; Baba, Tsutomu; Yusa, Hideo; Uchida, Shunsuke; Adachi, Tetsuro; Ohsumi, Katsumi; and Sato, Tomohiro, 4,880,595, Cl. 376-313.000.

Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, to Otsuka Pharmaceutical Company, Limited. 1-Cyclopropyl-6-fluoro-7-piperazinyl-1,4-Dihydro-4-oxo-quinoline-3-carboxylic acid derivatives. 4,880,806, Cl. 514-249.000.

Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, to Canon Kabushiki Kaisha. Ink ribbon cassette including means for identifying the type of ink ribbon contained therein and containing an ink ribbon having end indication means. 4,880,325, Cl. 400-249.000.

Ueda, Kunihiro: *See*—
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, 4,880,687, Cl. 428-141.000.

Ueda, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Bipolar transistor and CMOS transistor logic circuit having improved discharge capabilities. 4,880,998, Cl. 307-446.000.

Ueda, Nobuo: *See*—
Azuma, Makoto; Takahashi, Jun; Yamauchi, Hirohiko; and Ueda, Nobuo, 4,880,616, Cl. 424-1.100.

Ueda, Yutaka: *See*—
Yamauchi, Tosio; Tone, Shoichi; and Ueda, Yutaka, 4,880,175, Cl. 242-35.50R.

Uede, Hisashi: *See*—
Endo, Yoshihiro; Kawaguchi, Masashi; Kishishita, Hiroshi; and Uede, Hisashi, 4,880,661, Cl. 427-38.000.

Uehara, Akira: *See*—
Shibahara, Akihiro; Taguchi, Takehiko; Uehara, Akira; Shinohara, Koji; and Kawaguchi, Hiroshi, 4,880,318, Cl. 384-125.000.

Uehara, Kensuke: *See*—
Nitta, Tsuneo; Uehara, Kensuke; and Watanabe, Sadakazu, 4,881,266, Cl. 381-43.000.

Uemura, Hiroyuki: *See*—
Mochizuki, Hidehiro; Imamura, Masanaga; Suzuki, Akira; Shimada, Masaru; and Uemura, Hiroyuki, 4,880,768, Cl. 503-227.000.

Ueno, Ryuji: *See*—
Hayashi, Osamu; Ueno, Ryuji; and Kuno, Sachiko, 4,880,742, Cl. 435-238.000.

Ueno Seiyaku Kabushikikaisha: *See*—
Hayashi, Osamu; Ueno, Ryuji; and Kuno, Sachiko, 4,880,742, Cl. 435-238.000.

Uesugi, Masaki, to Hitachi, Ltd. Cassette loading apparatus. 4,881,138, Cl. 360-96.500.

Uesugi, Mitsuaki; Inomata, Masaichi; and Komine, Isamu, to NKK Corporation. Image composing apparatus. 4,881,126, Cl. 358-160.000.

Ueyama, Shinichiro; Yoshikawa, Yasuhiro; and Okamoto, Tetsuhiko, to Nippon Soda Co., Ltd. Process for producing organophosphazene polymers with chlorophosphazene. 4,880,905, Cl. 528-399.000.

Ugi, Siegfried: *See*—
Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, 4,880,986, Cl. 250-484.100.

UHDE GmbH: *See*—
Forster, Friedrich, 4,880,603, Cl. 422-218.000.

Uhrich, Kevin D., to Andco Environmental Processes, Inc. Method for removing dye stuffs from wastewater. 4,880,510, Cl. 204-131.000.

Ujiie, Kazuaki: *See*—
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,881,201, Cl. 365-189.090.

Umesato, Shoji: *See*—
Ichimura, Yoshiaki; Ishizuka, Shinichi; Komoto, Mitsuo; and Umesato, Shoji, 4,880,399, Cl. 439-689.000.

Unarco Industries, Inc.: *See*—
Djerf, Tobin, 4,879,794, Cl. 29-159.100.

Union Carbide Corporation: *See*—
Perrin, Jerry, 4,880,440, Cl. 55-16.000.

Union Oil Company of California: *See*—
Scherzer, Julius, 4,880,521, Cl. 208-120.000.

Uniroyal Chemical, Inc.: *See*—
Mishra, Anupama; and Moore, Richard C., 4,880,828, Cl. 514-438.000.

Uniroyal Chemical Ltd./Ltee: *See*—
Mishra, Anupama; and Moore, Richard C., 4,880,828, Cl. 514-438.000.

Unisys Corporation: *See*—
Lake, Ralph J., Jr., 4,880,191, Cl. 248-371.000.

United States of America
Agriculture: *See*—
Beremand, Marian N.; and Black, Patricia J., 4,880,747, Cl. 435-254.000.
Air Force: *See*—
Miller, George W.; and Theis, Clarence F., 4,880,443, Cl. 55-26.000.
Peterson, Phillip R.; Gavrielides, Athanasios; and Cardimona, David A., 4,880,996, Cl. 307-425.000.
America: *See*—
Lipham, Luke B.; Stuedemann, John A.; and Thompson, Frederick N., Jr., 4,880,632, Cl. 424-425.000.
Army: *See*—
Emeric, Dario A.; Miller, Christopher E.; Westich, Bryan; and Whiting, Lisa R., 4,880,478, Cl. 148-248.000.
Stern, Richard A.; and Babbitt, Richard W., 4,881,052, Cl. 333-24.100.
Energy: *See*—
Ackerman, John P.; and Miller, William E., 4,880,506, Cl. 204-1.500.
Aldissi, Mahmoud, 4,880,508, Cl. 204-59.00R.
Ashby, Carol I. H.; Myers, David R.; and Vook, Frederick L., 4,880,493, Cl. 156-628.000.
Barrus, Donald M.; Shires, Charles D.; and Brummond, William A., 4,880,596, Cl. 376-336.000.
Holcombe, Cressie E.; Dykes, Norman L.; and Meek, Thomas T., 4,880,578, Cl. 264-26.000.
Priatko, Gordon J.; and Kaskey, Jeffrey A., 4,881,190, Cl. 364-718.000.
Stelman, David, 4,880,608, Cl. 423-244.000.
Westhoff, James D.; and Harak, Arnold E., 4,880,528, Cl. 208-409.000.
Navy: *See*—
Ditman, L. Samuel, Jr., 4,880,296, Cl. 350-354.000.
Foster, David R.; and Schneider, Irwin, 4,881,234, Cl. 372-42.000.
Jablonski, Daniel G., 4,881,080, Cl. 342-357.000.
Knecht, John A.; and Chenoweth, Darrell L., 4,881,270, Cl. 382-17.000.

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Almering, Antonius F. J., 4,881,012, Cl. 315-209.00R.
Davids, Geert J. T.; and Wiertsema, Wiegert, 4,881,250, Cl. 377-60.000.
Drahanowsky, Walter, 4,880,181, Cl. 242-74.000.
Jatteau, Michel R.; Lelong, Pierre H.; Pauzat, Vincent; and Plard, Christian, 4,881,171, Cl. 364-413.240.
Paxman, David H.; Slatter, John A. G.; and Coe, David J., 4,881,119, Cl. 357-23.400.
Weekamp, Johannus W.; Fransen, Benedictus C. H.; and van der Ploeg, Hendrik, 4,881,151, Cl. 361-531.000.
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United Technologies Corporation: *See*—
Kromrey, Robert V., 4,880,688, Cl. 428-141.000.
Menard, Alan W.; and Turner, Clifford B., 4,879,846, Cl. 51-137.000.

UnitedTechnologies Corporation: *See*—
O'Connor, Gerald J., 4,879,792, Cl. 29-156.40R.

University of Auckland: *See*—
Boys, John T., 4,881,022, Cl. 318-800.000.

University of California, The Regents of the: *See*—
Kaufman, Leon; Arakawa, Mitsuaki; McCarten, Barry M.; Fehn, John H.; and Krasnor, Stephen, 4,881,034, Cl. 324-318.000.

University of Delaware: *See*—
Ih, Charles C., 4,880,286, Cl. 350-1.100.

University of Florida: *See*—
Bodor, Nicholas S., 4,880,816, Cl. 514-307.000.
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Jaeger, Marc J., 4,880,049, Cl. 165-6.000.
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,880,625, Cl. 424-84.000.

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Lipham, Luke B.; Stuedemann, John A.; and Thompson, Frederick N., Jr., 4,880,632, Cl. 424-425.000.

University of Illinois, The Board of Trustees of the: *See*—
Metcalf, Robert L.; and Lampman, Richard L., 4,880,624, Cl. 424-84.000.

University of Michigan, The Regents of the: *See*—
Holland, John H.; and Burks, Arthur W., 4,881,178, Cl. 364-513.000.

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Brueck, Steven R. J.; Schaus, Christian F.; Osinski, Marek A.; McInerney, John G.; Raja, M. Yasin A.; Brennan, Thomas M.; and Hammons, Burrell E., 4,881,236, Cl. 372-45.000.

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Mentzer, Robert M., Jr.; Ely, Stephen W.; Lasley, Robert D.; and Berne, Robert M., 4,880,783, Cl. 514-46.000.

Uomi, Kazuhisa: *See*—
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Bedard, Robert L.; Vail, Lawrence D.; Wilson, Stephen T.; and Flanigen, Edith M., 4,880,761, Cl. 502-215.000.
Chang, Chin-Hsing, 4,880,920, Cl. 536-127.000.
Imai, Tamotsu; and Abrevaya, Hayim, 4,880,764, Cl. 502-326.000.
Koves, William J., 4,880,604, Cl. 422-220.000.
Kulprathipanja, Santi, 4,880,919, Cl. 536-127.000.
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith M., 4,880,520, Cl. 208-46.000.
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Upjohn Company, The: *See*—
Balog, Stephen; and Hiestand, Everett N., 4,880,373, Cl. 425-149.000.
Hester, Jackson B., Jr.; Thaisrivongs, Suvit; Sawyer, Tomi K.; TenBrink, Ruth E.; Saneii, Hossain H.; Schostarez, Heinrich J.; and Pals, Donald T., 4,880,781, Cl. 514-18.000.

Urai, Takahiko, to NEC Corporation. Erasable programmable read only memory device. 4,881,200, Cl. 365-189.040.

Urakami, Hideaki. Warm bath for hands and feet. 4,880,415, Cl. 604-291.000.

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Urashima, Kazuhiro; Watanabe, Masakazu; Tajima, Yo; and Nakanishi, Kenji, to NGK Spark Plug Co., Ltd. Silicon nitride sintered product. 4,880,756, Cl. 501-97.000.

Urashima, Nobuaki: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,880,857, Cl. 523-205.000.

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Press, Jeffery B.; and Urbanski, Maud, 4,880,824, Cl. 514-368.000.

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Nakagawa, Susumu; Mitomo, Ryuji; and Ushijima, Ryosuke, 4,880,797, Cl. 514-206.000.

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Kitano, Kisei; Uchida, Manabu; Ushioda, Makoto; and Suzuki, Toshiharu, 4,880,562, Cl. 252-299.630.

USI Lighting, Inc.: *See*—
Pahl, Scott T., 4,881,157, Cl. 362-371.000.

Utamura, Shinji: *See*—
Nakai, Akiya; Hamasaki, Bunei; and Utamura, Shinji, 4,881,100, Cl. 355-53.000.
UTB Umwelttechnik Buchs AG: *See*—
Gorlich, Lothar, 4,880,606, Cl. 423-220.000.
Utz, Andreas: *See*—
Moll, Reiner; and Utz, Andreas, 4,879,955, Cl. 108-50.000.
Uzawa, Satoshi: *See*—
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Vacilotto, Steven J. Eyewear. 4,879,770, Cl. 2-441.000.
Vail, Lawrence D.: *See*—
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Vajda, Miklos: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.
Valenzuela, Pablo D. T.: *See*—
Burke, Rae L.; Rosenberg, Steven; Shuster, Jeffrey R.; Tekamp-Olson, Patricia; Valenzuela, Pablo D. T.; and Barr, Philip J., 4,880,734, Cl. 435-68.000.
Valet, Andreas: *See*—
Slongo, Mario; Rody, Jean; Sitek, Franciszek; and Valet, Andreas, 4,880,859, Cl. 524-91.000.
Valiton, Anne S.: *See*—
Sager, David J.; Valiton, Anne S.; Stickney, Jay C.; and Ramanujan, Raj K., 4,881,165, Cl. 364-200.000.
Valley, Irvin L. Airport twenty-four hour pilot information markers. 4,879,965, Cl. 116-209.000.
Valor International Ltd.: *See*—
Britton, John, 4,881,011, Cl. 315-209.0SC.
Van Dorn Company: *See*—
Gallagher, Thomas A.; Knowlton, Paul; and Patarini, Leon, 4,880,131, Cl. 220-83.000.
van Breen, Adriaan W.: *See*—
Kinneberg, Peter A.; Armer, Thomas A.; van Breen, Adriaan W.; Barton, Roger E. C.; and Klei, Ebel, 4,880,904, Cl. 528-392.000.
Van Broekhoven, Johannes A. M.; Drent, Eit; Klei, Ebel; and Nozaki, Kenzie, to Shell Oil Company. Polyketone from carbon monoxide and mixture of olefins. 4,880,903, Cl. 528-392.000.
Van Broekhoven, Johannes A. M.; and Doyle, Michael J., to Shell Oil Company. Removal of catalyst residues from carbon monoxide/olefin polymers with oxidant/phosphine treatment. 4,880,909, Cl. 528-487.000.
Van Cauter, Albert: *See*—
Thomas, Jean-Francois; Terneu, Robert; Van Cauter, Albert; and Van Laethem, Robert, 4,880,698, Cl. 428-333.000.
Van Daele, Georges H. P.; Vlaeminck, Freddy F.; and Verdonck, Marc G. C., to Janssen Pharmaceutica N.V. N-aryl-piperazinealkanamides useful for improving sleep. 4,880,808, Cl. 514-255.000.
van Delden, Hildegard: *See*—
Baehr, Bernd D.; Rall, Ulrich; van Delden, Hildegard; and Lillotte, Wolfgang, 4,880,566, Cl. 252-389.220.
Vandenberg, August; Vandenberg, Ben W.; Vanderberg, Andrew W.; and Haws, Ben E. Controlled lift gate system for milking parlors. 4,879,971, Cl. 119-14.030.
Vandenberg, Ben W.: *See*—
Vandenberg, August; Vandenberg, Ben W.; Vanderberg, Andrew W.; and Haws, Ben E., 4,879,971, Cl. 119-14.030.
Van Den Pol, Aart A., to De Ark B.V. Swivel platform for a rail vehicle. 4,880,341, Cl. 410-1.000.
Vanderberg, Andrew W.: *See*—
Vandenberg, August; Vandenberg, Ben W.; Vanderberg, Andrew W.; and Haws, Ben E., 4,879,971, Cl. 119-14.030.
Van Der Meer, Wiebe H.: *See*—
Fisher, Paul C., Jr.; Van Der Meer, Wiebe H.; and Fisher, Paul C., 4,881,088, Cl. 346-140.00R.
van der Ploeg, Hendrik: *See*—
Weekamp, Johannus W.; Fransen, Benedictus C. H.; and van der Ploeg, Hendrik, 4,881,151, Cl. 361-531.000.
VanDerStuyf, Allen F.: *See*—
Sergeant, Ronald G.; and VanDerStuyf, Allen F., 4,879,810, Cl. 29-861.000.
van Doorn, Johannes A.; Snel, Johannes J. M.; Meijboom, Nicolaas; and Wife, Richard L., to Shell Oil Company. Carbon monoxide/olefin polymerization process with bis (diaryl phosphino) 2-silapropane containing catalyst. 4,880,900, Cl. 528-392.000.
van Doorn, Johannes A.; Wife, Richard L.; and Budzelaar, Petrus H. M., to Shell Oil Company. Copolymerization of carbon monoxide and olefin with diphosphine having heterocyclic substituents as catalyst. 4,880,902, Cl. 528-392.000.
Van Gelder, Cornelius A.: *See*—
Brackmann, Walter H., Jr.; Van Gelder, Cornelius A.; and Halushka, Roman A., 4,880,390, Cl. 439-204.000.
Van Gent, Stanley L.: *See*—
Ting, Albert C.; Willis, Timothy R.; Christ, F. Richard; Bacich, Steven R.; Pettit, Dean K.; Van Gent, Stanley L.; and Day, Jeffrey C., 4,880,426, Cl. 623-6.000.
Van Ghemen, Max E.: *See*—
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 4,880,492, Cl. 156-610.000.
Van Horn, John W.; and Johnson, Clyde, to Duncan Industries Parking Control Systems Corp. Meter handle mechanism. 4,880,406, Cl. 464-38.000.
Van Laethem, Robert: *See*—
Thomas, Jean-Francois; Terneu, Robert; Van Cauter, Albert; and Van Laethem, Robert, 4,880,698, Cl. 428-333.000.
Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Perfluorinated surface-active oligomers, process for their preparation and compositions containing these oligomers. 4,880,620, Cl. 424-70.000.
VanRens, Russell J., to Outboard Marine Corporation. Lost foam transfer passage cavity construction. 4,880,047, Cl. 164-45.000.
Vansant, Jan L. M. F. G.: *See*—
Nolf, Jean-Marie E.; Vansant, Jan L. M. F. G.; and Jensen, Michael L., 4,880,962, Cl. 219-549.000.
Van Scoyk. Pershing R. Saddle blanket with compartments. 4,879,865, Cl. 54-66.000.
Vaquero, Juan J.: *See*—
Sunkel, Carlos; Fay de Casa Juana, Miguel; Dorrego, Fernando; Pando, Basilio; Alvarez-Builla, Julio; Vaquero, Juan J.; Galera, Carlos; and Vazquez, Maria L., 4,880,894, Cl. 548-152.000.
Varadarajan, Krishnaraju: *See*—
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.
Varel Manufacturing Company: *See*—
Bronson, Charles L., 4,880,068, Cl. 175-369.000.
Vasilia, Ltd.: *See*—
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Vasquez, Dario, Jr.: *See*—
Dickson, James E.; and Vasquez, Dario, Jr., 4,880,284, Cl. 312-263.000.
Vatoux, Sylvie; Papuchon, Michel; and Lefevre, Herve , to Thomson-CSF. Integrated optical waveguide, method for its manufacture, and its use in an electro-optical modulator. 4,880,288, Cl. 350-96.120.
Vaughn, Charles J., to GTE Government Systems Corporation. Signal generator for producing accurately timed pulse groupings. 4,881,040, Cl. 328-61.000.
Vazquez, Maria L.: *See*—
Sunkel, Carlos; Fay de Casa Juana, Miguel; Dorrego, Fernando; Pando, Basilio; Alvarez-Builla, Julio; Vaquero, Juan J.; Galera, Carlos; and Vazquez, Maria L., 4,880,894, Cl. 548-152.000.
VEB Kombinat Polygraph, "Werner Lamberz", Leipzig: *See*—
Hank, Dietrich; and Bruggemann, Peter, 4,881,182, Cl. 364-519.000.
VEB Mesgeraetewerk "Erich Weinert" Magdeburg, Betrieb des Kombinates VEB EAW Berlin-Treptow: *See*—
Kienitz, Ulrich, 4,880,314, Cl. 374-129.000.
Velcro Industries B.V.: *See*—
Handler, Michael D., 4,879,854, Cl. 52-238.100.
Vennike, Torben, to Ildvaco Engineering A/S. Reverse angle doctor blade assembly. 4,879,949, Cl. 101-157.000.
Ventura, Francis P., to T W Kutter Inc. Form, fill, and seal apparatus. 4,879,864, Cl. 53-559.000.
Verdonck, Marc G. C.: *See*—
Van Daele, Georges H. P.; Vlaeminck, Freddy F.; and Verdonck, Marc G. C., 4,880,808, Cl. 514-255.000.
Veres, Zsuzsa: *See*—
Szabolcs nee Borbas, Anna; Otvos, Laszlo ; Sagi, Janos; Tudos nee Feuer, Helga; Szemzo , Attila; Veres, Zsuzsa; Szinai, Istvan; Vajda, Miklos; Csernus, Istvan; Marossy, Katalin; Jancso , Sandor; Medgyesi nee Lukacs, Eva; and Bacsa, Gyorgy, 4,880,785, Cl. 514-50.000.
Versa Corporation: *See*—
Leemkuil, Hendrik; and Zilber, Eugene A., 4,880,099, Cl. 198-371.000.
Verse, Gisbert; and Schroder, Michael. Base for a loudspeaker enclosure. 4,880,077, Cl. 181-207.000.
Vervacke, Steven L.: *See*—
Miller, Robert E.; Vervacke, Steven L.; Bahowick, Timothy J.; and Glanz, Kenneth D., 4,880,766, Cl. 503-212.000.
Vetter, Manfred. Pneumatic bolster for sealing damaged walls of containers and pipes. 4,880,035, Cl. 138-99.000.
Vicenes, Rudy, to Speath Design. Knock-down topiary form. 4,879,838, Cl. 47-45.000.
Vidal, Andre : *See*—
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Videojet Systems International, Inc.: *See*—
Loria, Adrian; and Aguilar, Josephine, 4,880,465, Cl. 106-20.000.
Vietto, Paolo: *See*—
Martini, Francesco; Perazzo, Luigi; and Vietto, Paolo, 4,880,592, Cl. 264-514.000.
Vin, Gaurang R.: *See*—
Dastoli, Frank R.; Senkowski, Bernard Z.; Wagener, Dieter W.; Bogdanffy, George H.; and Vin, Gaurang R., 4,880,581, Cl. 264-39.000.
Vince, David: *See*—
Dowing, Richard; Paull, Jolanta; and Vince, David, 4,879,952, Cl. 102-331.000.
Vincent, James P., to International Business Machines Corp. Method for providing information security protocols to an electronic calendar. 4,881,179, Cl. 364-518.000.
Vischer, Peter, to Adolph Coors Company. Alignment apparatus. 4,879,815, Cl. 33-293.000.
Visseau, Gary A.: *See*—
Eldridge, Gerald E.; and Visseau, Gary A., 4,880,500, Cl. 162-279.000.

Viswanathan, Nal T.: *See*—
Scott, John C.; Li, Eric K.; Washburn, Hudson A.; and Viswanathan, Nal T., 4,880,514, Cl. 204-192.200.

Vlaeminck, Freddy F.: *See*—
Van Daele, Georges H. P.; Vlaeminck, Freddy F.; and Verdonck, Marc G. C., 4,880,808, Cl. 514-255.000.

Voest-Alpine Aktiengesellschaft: *See*—
Ehrenfeldner, Richard; and Wagner, Dieter, 4,880,489, Cl. 156-345.000.

Vogel, Martin: *See*—
Kowalski, Alexander; and Vogel, Martin, 4,880,842, Cl. 521-64.000.

Vogt, Hans-Gunter: *See*—
Tork, Leo; Vogt, Hans-Gunter; and Heins, Ferdinand, 4,880,673, Cl. 427-412.000.

Volcansek, Steven J.: *See*—
Johnston, Lonnie E.; and Volcansek, Steven J., 4,879,819, Cl. 33-833.000.

Volker, Wolfgang: *See*—
Donnerhack, Andreas; Thoma, Klemens; Volker, Wolfgang; Stratz, Thomas; and Gallmeister, Rolf-Dieter, 4,880,003, Cl. 128-374.000.

Vollbrecht, Heinz-Rudiger: *See*—
Schutz, Erwin; and Vollbrecht, Heinz-Rudiger, 4,880,656, Cl. 426-386.000.

Vom Braucke, Hans; Vom Braucke, Manfred; and Westerwelle, Dieter, to Bielefelder Kuchenmaschinen-und Transportgerate-Fabrik Vom Braucke GmbH. Handled tool suspension device. 4,880,192, Cl. 248-110.000.

Vom Braucke, Manfred: *See*—
Vom Braucke, Hans; Vom Braucke, Manfred; and Westerwelle, Dieter, 4,880,192, Cl. 248-110.000.

von Arb, Hans-Peter; Durr, Ulrich; Gressly, Andre ; and Studer, Franz. Laser with improved cooling system. 4,881,233, Cl. 372-35.000.

von Ballmoos, Roland; Chu, Cynthia T-W.; Landis, Michael E.; and Derouane, Eric G., to Mobil Oil Corp. Crystalline composition. 4,880,611, Cl. 423-306.000.

Von Haas, Rainer, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Tool arrangement having angular position fixing means. 4,879,930, Cl. 82-158.000.

Vook, Frederick L.: *See*—
Ashby, Carol I. H.; Myers, David R.; and Vook, Frederick L., 4,880,493, Cl. 156-628.000.

Vosti, Donald C.: *See*—
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.

Vuillet, Alain E.; Philippe, Jean J.; and Desopper, Andre , to Aerospatiale Societe Nationale Industrielle; and Office National D'Etudes et de Recherches Aerospatiales. Blade with curved end for a rotary airfoil of an aircraft. 4,880,355, Cl. 416-228.000.

Vyprachticky, Emil: *See*—
Dieringer, Dale E.; and Vyprachticky, Emil, 4,879,828, Cl. 42-50.000.

W. C. Heraeus GmbH: *See*—
Witt, Jurgen, 4,880,988, Cl. 250-504.00R.

W. R. Grace & Co.-Conn.: *See*—
Martini, Francesco; Perazzo, Luigi; and Vietto, Paolo, 4,880,592, Cl. 264-514.000.
Welsh, William A., 4,880,574, Cl. 260-428.000.

Waagner-Biro Aktiengesellschaft: *See*—
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Wachtel, James A.: *See*—
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.

Wacker-Chemie GmbH: *See*—
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Wada, Motoi: *See*—
Ishida, Yasumasa; Kawamoto, Hiroyuki; Wada, Motoi; Hatoh, Hisamitu; Miyatake, Yoshiteru; Mori, Sadao; and Takahashi, Eiji, 4,881,026, Cl. 324-71.100.

Wagener, Dieter W.: *See*—
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Wagner, Dieter: *See*—
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Wagner, John R., Jr.: *See*—
Mazuera, Gonzalo E.; and Wagner, John R., Jr., 4,880,706, Cl. 428-516.000.

Wahle, Bernd; Anzinger, Hermann; Ziche, Horst; and Schinski, Erhard, to Henkel Kommanditgesellschaft auf Aktien. Water-soluble polycondensates based on fatty acids, dialkanolamine and maleic anhydride, a process for their production, hydraulic compositions containing them and their use. 4,880,898, Cl. 528-272.000.

Waitkus, Phillip A., to Plastics Engineering Company. Novel thermosetting compositions and molding method. 4,880,893, Cl. 528-129.000.

Wakamatsu, Seiichi: *See*—
Imade, Shinichi; Shionoya, Kazunori; Ikuta, Eishi; Taguchi, Koji; Nishiyama, Toyoo; Wakamatsu, Seiichi; and Nagasaki, Tatsuo, 4,880,011, Cl. 128-662.060.

Wako Corporation: *See*—
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Walega, William: *See*—
Becka, Michael M.; and Walega, William, 4,879,778, Cl. 12-146.00D.

Walker, Richard S. Grasping means associated with retrieval means for infusion packages. 4,880,110, Cl. 206-0.500.

Walker, Watson F.; and Sutherland, Jack L., to Harris Corporation. Improved signalling method and apparatus. 4,881,245, Cl. 375-38.000.

Wall, Paul G. Action for upright piano. 4,879,939, Cl. 84-240.000.

Wallace, Barry M.; and Fasolino, Ross, to Texas Instruments Incorporated. Method and apparatus for boresight alignment of armored battlefield weapons. 4,879,814, Cl. 33-234.000.

Wallace, Gary W.: *See*—
Graves, William H., Jr.; Wallace, Gary W.; Bradford, Bruce P.; Carpenter, Carolyn R.; Smith, Kenneth W.; and Toft, Howard C., 4,880,018, Cl. 131-375.000.

Waller, James K., Jr. Automatic gain expansion system. 4,881,047, Cl. 330-282.000.

Wallet, Steven A. Oil collection and disposal device. 4,880,156, Cl. 232-43.100.

Wallis, Christopher J.; Finch, Harry; and Hallett, Peter, to Glaxo Group Limited. Aminocyclopentyl ethers and pharmaceutical formulation. 4,880,800, Cl. 514-211.000.

Walls, John E.; and Dhillon, Major S., to Hoechst Celanese Corporation. Enzyme hydrolyzed maltodextrin containing finisher/preserver/cleaner composition for lithographic printing plates. 4,880,555, Cl. 252-143.000.

Walls, Thomas J. Shoe lace knot securing device. 4,879,787, Cl. 24-712.200.

Wang, Da Y.; Kennedy, Daniel T.; and MacAllister, Burton W., Jr., to GTE Laboratories Incorporated. Gas sensor element. 4,880,519, Cl. 204-425.000.

Wang, Patrick S., to Johnson Electric Industrial Manufactory, Ltd. Armature for an electric motor. 4,881,000, Cl. 310-234.000.

Wanta, Mark S., to General Signal Corporation. Dark field target design system for alignment of semiconductor wafers. 4,880,309, Cl. 356-401.000.

Warner, Barry N.: *See*—
Bloomquist, Marvin G.; and Warner, Barry N., 4,881,209, Cl. 367-52.000.

Warrell, Raymond P., Jr., to Memorial Hospital for Cancer and Allied Diseases. Use of C-5 mono-substituted barbiturates to treat disorders of uric acid metabolism. 4,880,811, Cl. 514-270.000.

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Murray, Alexander P.; Slater, Clifton G.; and White, Robert W., 4,880,559, Cl. 252-186.210.
Smith, Richard C.; Bartko, John; and Fero, Arnold H., 4,881,247, Cl. 376-257.000.

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Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.

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Pfisterer, Helmut; Schutze, Wolfgang; and Wezel, Heinz, 4,881,031, Cl. 324-233.000.

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Tillman, Ennis L.; and Caldwell, James R., 4,880,258, Cl. 285-7.000.

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Baker, Ross G., Jr.; Calfee, Richard V.; Haluska, Edward A.; and Whistler, Stephen J., 4,880,004, Cl. 128-419.0PG.

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Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L., 4,880,211, Cl. 266-44.000.

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Graves, Lee K., 4,880,271, Cl. 257-284.000.
Lambropoulos, George; Pitera, Kenneth R.; and Hair, Robert A., 4,881,148, Cl. 361-172.000.

Widlund, Urban, to Molnlycke AB. Disposable absorbent article such as a diaper or an incontinence protector. 4,880,421, Cl. 604-385.200.

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Hirth, Michael; and Wiegart, Norbert, 4,880,685, Cl. 423-210.000.

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Davids, Geert J. T.; and Wiertsema, Wiegert, 4,881,250, Cl. 377-60.000.

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van Doorn, Johannes A.; Snel, Johannes J. M.; Meijboom, Nicolaas; and Wife, Richard L., 4,880,900, Cl. 528-392.000.
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Wiggins, Richard F., to Boeing Company, The. Piece locating system for painting or the like. 4,880,101, Cl. 198-403.000.

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Hagglund, Hans; Ericsson, Lars; and Wiklund, Rudolf, 4,880,212, Cl. 266-94.000.

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Williams, Robert A.; and Herron, Jeffrey W., 4,880,999, Cl. 310-37.000.

Williams, Mark A.: *See*—
McHenry, Robert J.; Brito, Joseph B.; Piatt, Wilson T., Jr.; Reed, Robert J.; Varadarajan, Krishnaraju; Spencer, Kenneth B.; Tsai, Boh C.; Williams, Mark A.; Vosti, Donald C.; and Wachtel, James A., 4,880,129, Cl. 220-70.000.

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Savins, J. George; Hugenberger, Scott G.; and Wilson, Peggy M., 4,880,444, Cl. 55-36.000.

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Winblad, Bengt; and Norberg, Astrid. Feeding device. 4,880,409, Cl. 604-73.000.

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Winkler, Hans-Henning; and Rutschle, Eugen, to Chiron-Werke GmbH & Co. KG. Gripper for tools of a machine tool. 4,879,802, Cl. 29-568.000.

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Nowak, Gerhard; Kruschik, Klaus; Morbitzer, Hans P.; Theuer, Rudolf; and Winter, Alfred, 4,880,252, Cl. 280-618.000.

Winters, Melvin M.: *See—*
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Thompson, Murray A., 4,881,161, Cl. 364-167.010.

Wisotzki, Klaus-Dieter: *See—*
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Witkowski, Thomas S.: *See—*
Henslee, Walter W.; and Witkowski, Thomas S., 4,880,757, Cl. 501-104.000.

Witt, Jurgen, to W. C. Heraeus GmbH. Light and weathering testing apparatus. 4,880,988, Cl. 250-504.00R.

Wittke, Christian A. Illuminated characters of graphic symbols for external fixing to vehicles. 4,879,826, Cl. 40-551.000.

Witwicki, Paul W.: *See—*
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Wolfle, Erwin: *See—*
Jehle, Franz; Konig, Martin; and Wolfle, Erwin, 4,881,077, Cl. 342-26.000.

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Kaltbeitzel, Gunter; Klein, Michael; Renner, Martin; and Wolk, Joachim, 4,881,229, Cl. 371-20.400.

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Woltmann, Klaus: *See—*
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Wong, Raymond W.: *See—*
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Woo, Edmund P.: *See—*
Mullins, Michael J.; Crain, Steven P.; Woo, Edmund P.; and Murray, Daniel J., 4,880,884, Cl. 525-469.000.

Wood, Theodore N., Jr. Protective cap assembly. 4,880,134, Cl. 220-85.00P.

Woodward, Daniel A., to Northern Telecom Limited. Method for locating and supporting ceramic substrates. 4,880,349, Cl. 414-786.000.

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Oliphant, Jean R.; Workman, Harold W.; and Shah, Jasvantrai C., 4,881,261, Cl. 379-215.000.

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Worth, Peter H. L.; Eaton, Ann; and Steer, Peter L., to E. R. Squibb and Sons, Inc. Penile clamp. 4,880,016, Cl. 128-885.000.

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Woudsma, Roberto; Chong, David C. H.; McSweeney, Brian T.; Borgers, Stephanus M. C.; and Habraken, Egidius A. P., to U.S. Philips Corporation. One-dimensional linear picture transformer. 4,881,192, Cl. 364-725.000.

Wright, Bradford B., to Minnesota Mining & Manufacturing Company. Siloxy ketenes and products prepared therefrom. 4,880,705, Cl. 428-447.000.

Wright, H. Earl, to Earl Wright Company. Foam dispensing device. 4,880,161, Cl. 239-330.000.

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Booth, Rodney I.; Edwards, David W.; Wrigley, Colin W.; and Orth, Robert A., 4,879,897, Cl. 73-59.000.

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Wuerzer, Bruno: *See—*
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Wulf, Elmer B.; and Wulf, Mark E., 4,880,251, Cl. 280-613.000.

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Tam, Man C.; Gundlach, Robert W.; and Pundsack, Arnold L., 4,880,715, Cl. 430-41.000.

Yaba, Susumu: *See—*
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Yabe, Hisao: *See—*
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Hirai, Hiroyuki; and Yabuki, Yoshiharu, 4,880,723, Cl. 430-218.000.

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Yagi, Manabu, to NEC Corporation. QAM modulator/demodulator. 4,881,049, Cl. 332-103.000.

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Yahiro, Hiroshi: *See—*
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Yamada, Eiji: *See—*
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Yamada, Hideaki; Enomoto, Kanehiko; and Watanabe, Ichiro, to Yamada, Hideaki; and Nitto Kagaku Kogyo Kabushiki Kaisha. Method of cultivation of pseudomonas bacteria. 4,880,739, Cl. 435-129.000.

Yamada, Junji; Mawatari, Yasushi; Ikegami, Toru; Nishio, Koichi; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Ugi, Siegfried, to Toshiba Glass Co., Ltd.; and Kernforschungszentrum Karlsruhe GmbH. System for measuring radiation doses using fluorescent dosemeters. 4,880,986, Cl. 250-484.100.

Yamada, Kiyoshi: *See—*
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Yamada, Masahiro, to Asahi Research Corporation. Video camera and recorder system with illumination control features. 4,881,128, Cl. 358-228.000.

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Yamada, Shinjiro, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Switching apparatus for vehicle locking device. 4,880,263, Cl. 292-216.000.

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Yamada, Shoji: *See—*
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Yamagishi, Ryoji: *See—*
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Yamaguchi, Hitoshi, to Mabuchi Motor Co., Ltd. Miniature motor. 4,881,002, Cl. 310-261.000.

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Gotoh, Taiji; Yamamoto, Hidetoshi; and Yamada, Kiyoshi, 4,880,260, Cl. 285-382.200.

Yamamoto, Kanshi: *See*—
Hojo, Takeshi; Yamamoto, Kanshi; Kawada, Shinichi; Murabayashi, Kazushige; Akimoto, Mamoru; and Fukano, Michio, 4,879,918, Cl. 74-5.470.

Yamamoto, Koji: *See*—
Otsubo, Kazunari; Ezoe, Motonobu; Ago, Hideo; and Yamamoto, Koji, 4,880,896, Cl. 528-196.000.

Yamamoto, Masato; Nakajima, Masahiro; and Yamanaka, Toshimasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. SLR camera with auxiliary light emitter. 4,881,098, Cl. 354-403.000.

Yamamoto, Shigeo: *See*—
Yomogida, Toshihiko; Yamashita, Tsuyoshi; Yamamoto, Shigeo; Tobita, Hideaki; Nakamura, Hisanori; and Kobayashi, Goro, 4,881,220, Cl. 370-16.000.

Yamamoto, Takushi: *See*—
Obayashi, Shigeji; Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,880,888, Cl. 526-209.000.

Yamamoto, Tohru. Aromatic composition and method for the production of the same. 4,880,851, Cl. 523-102.000.

Yamamoto, Yasushi: *See*—
Takago, Toshio; and Yamamoto, Yasushi, 4,880,927, Cl. 544-193.000.

Yamamoto, Yoshinori: *See*—
Meguro, Hiroshi; Yamamoto, Yoshinori; Ohyama, Masao; Horikawa, Kenichi; Mizusawa, Shigeru; and Kawakami, Kenji, 4,881,137, Cl. 360-96.500.

Yamamura, Shinichi: *See*—
Sako, Yoichiro; and Yamamura, Shinichi, 4,881,232, Cl. 371-37.400.

Yamanaka, Toshimasa: *See*—
Yamamoto, Masato; Nakajima, Masahiro; and Yamanaka, Toshimasa, 4,881,098, Cl. 354-403.000.

Yamane, Toshinobu; Kuramoto, Akio; Shimizu, Ryuji; and Nakayama, Makoto, to NEC Corporation. Tracking system with beam switching antenna. 4,881,078, Cl. 342-155.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 4,880,841, Cl. 514-654.000.
Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, 4,880,823, Cl. 514-356.000.
Yamahira, Yoshiya; Okuzawa, Yoshiko; Fujioka, Keiji; Sato, Shigeji; and Ishikawa, Reimei, 4,880,796, Cl. 514-206.000.

Yamashita, Koujirou: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,880,474, Cl. 134-21.000.

Yamashita, Shinichi: *See*—
Kanno, Hideo; Yamashita, Shinichi; Omata, Satoshi; Enari, Masahiko; Kuno, Mitsutoshi; and Osada, Yoshiyuki, 4,881,066, Cl. 340-719.000.

Yamashita, Shuiichi: *See*—
Kijima, Toshio; Tezuka, Tokuya; Doi, Yoji; Yamashita, Shuiichi; Namba, Shigetoh; and Arie, Tsutomu, 4,880,745, Cl. 435-253.300.

Yamashita, Toshihiko. Encoding magnetic cards. 4,880,963, Cl. 235-449.000.

Yamashita, Tsuyoshi: *See*—
Yomogida, Toshihiko; Yamashita, Tsuyoshi; Yamamoto, Shigeo; Tobita, Hideaki; Nakamura, Hisanori; and Kobayashi, Goro, 4,881,220, Cl. 370-16.000.

Yamauchi, Hirohiko: *See*—
Azuma, Makoto; Takahashi, Jun; Yamauchi, Hirohiko; and Ueda, Nobuo, 4,880,616, Cl. 424-1.100.

Yamauchi, Tosio; Tone, Shoichi; and Ueda, Yutaka, to Murata Kikai Kabushiki Kaisha. Tension setting and controlling method and apparatus in an automatic winder. 4,880,175, Cl. 242-35.50R.

Yamauchi, Yukiji; Tsukamoto, Nobuo; and Koya, Masahiro, to Hitachi, Ltd. Portable wireless communication systems. 4,881,271, Cl. 455-56.000.

Yamazaki, Hideo; and Kubota, Kazunori, to Ricoh Company, Ltd. Sorter having a mechanism for driving bins stepwise. 4,880,223, Cl. 271-293.000.

Yamazaki, Hiroshi; Hara, Toshiyuki; Tanaka, Yuji; and Mouri, Takayuki, to Ikeda Bussan Co., Ltd.; and Ohi Seisakusho Co., Ltd. Latch device for inclinable back rest cushion mounted in seatback. 4,880,264, Cl. 292-226.000.

Yamazaki, Hiroshi: *See*—
Ogihara, Masuo; Ishida, Hiroyuki; Nagaoka, Shinji; Seki, Youichi; Tagami, Shigeru; Yamazaki, Hiroshi; and Shinozaki, Nobuo, 4,881,096, Cl. 354-400.000.

Yamazaki, Makoto: *See*—
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Yanagawa, Yutaka, to Olympus Optical Co., Ltd. Ultrasonic imaging apparatus. 4,880,009, Cl. 128-660.090.

Yanidis, Apostol, to James River II, Inc. Flexible packaging material containing an antioxidant. 4,880,696, Cl. 428-349.000.

Yano, Shunji: *See*—
Inoue, Kazuo; Kubota, Osamu; Yano, Shunji; Tateishi, Fusao; Noda, Etsuo; Yamaguchi, Koji; and Endo, Tsuneo, 4,880,351, Cl. 415-164.000.

Yao, Raymond C.: *See*—
Fayerman, Jeffrey T.; Jones, Michael D.; Michel, Karl H.; Yao, Raymond C.; and Zmijewski, Milton J., 4,880,735, Cl. 435-71.000.

Yasinski, Kenneth M.: *See*—
Aberson, James A., Jr.; DeVeau, George F.; and Yasinski, Kenneth M., 4,880,291, Cl. 350-96.210.

Yasue, Takao: *See*—
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,880,975, Cl. 250-306.000.

Yazaki Corporation: *See*—
Kuzuno, Katsutoshi; Watanabe, Hiroshi; and Ishizuka, Shigeo, 4,880,943, Cl. 174-72.00A.
Mochizuki, Shigehiko; Kanda, Masahiro; and Serizawa, Yoshinori, 4,880,389, Cl. 439-125.000.

Yazu, Shuji: *See*—
Itozaki, Hideo; Tanaka, Saburo; Fujita, Nobuhiko; Yazu, Shuji; and Jodai, Tetsuji, 4,880,773, Cl. 505-1.000.

Yehushua, Moshe: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,881,240, Cl. 375-15.000.

Yokogawa Electric Corporation: *See*—
Sakai, Yoshikatsu; Nakai, Yasuo; Miyabe, Asao; and Kawano, Takafumi, 4,881,160, Cl. 364-161.000.

Yokogawa, Kazufumi; Harada, Naoki; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Aryl monoazo pyridone yellow compound having two vinylsulfone type fiber reactive groups bonded to a triazine ring for dyeing cellulose or polyamide. 4,880,431, Cl. 8-549.000.

Yokogawa Medical Systems, Limited: *See*—
Takeuchi, Yasuhito, 4,881,212, Cl. 367-152.000.

Yokohama Rubber Co., Ltd., The: *See*—
Kitami, Tetsu; and Mito, Jun, 4,880,036, Cl. 138-137.000.

Yokoi, Takeshi: *See*—
Nishigaki, Shinichi; Nakamura, Takeaki; Yoshinaga, Jun; Kanno, Masahide; Yabe, Hisao; Yokoi, Takeshi; Oozeki, Kazuhiko; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,879,992, Cl. 128-6.000.

Yokono, Hitoshi: *See*—
Ushio, Jiro; Miyazawa, Osamu; Yokono, Hitoshi; and Tomizawa, Akira, 4,880,464, Cl. 106-1.050.

Yokota, Shoji: *See*—
Ogawa, Katayasu; Ohtani, Go; Yokota, Shoji; and Aruga, Masayoshi, 4,880,823, Cl. 514-356.000.

Yokouchi, Hisatake; Takahashi, Fumitaka; and Tsuneoka, Masayuki, to Hitachi, Ltd.; and Hitachi Medical Corporation. X-ray television apparatus. 4,881,124, Cl. 358-111.000.

Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, to TDK Corporation. Magnetic recording medium. 4,880,687, Cl. 428-141.000.

Yokoyama, Noriyasu: *See*—
Morita, Yoshitsugu; Yokoyama, Noriyasu; and Yoshida, Keiji, 4,880,882, Cl. 525-446.000.

Yomogida, Toshihiko; Yamashita, Tsuyoshi; Yamamoto, Shigeo; Tobita, Hideaki; Nakamura, Hisanori; and Kobayashi, Goro, to Toyoda Koki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kiahsa. Multiplex communication system for sequence controllers. 4,881,220, Cl. 370-16.000.

Yoneyama, Takashi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Hashimoto, Akihiro; Okita, Tsutomu; and Yoneyama, Takashi, 4,680,693, Cl. 428-323.000.

Yoo, Sung-Eun: *See*—
Carini, David J.; Duncia, John Jonas V.; and Yoo, Sung-Eun, 4,880,804, Cl. 514-234.500.

Yoshida, Atsuya: *See*—
Kubo, Hiroshi; and Yoshida, Atsuya, 4,880,965, Cl. 250-213.0VT.

Yoshida, Keiji: *See*—
Morita, Yoshitsugu; Yokoyama, Noriyasu; and Yoshida, Keiji, 4,880,882, Cl. 525-446.000.

Yoshida, Kouichi; and Harada, Noritake, to Kabushikigaisha Tokyo Kikai Seisakusho. Ink supplying device. 4,879,951, Cl. 101-363.000.

Yoshida, Shigekazu: *See*—
Niwayama, Kazuhiko; Nakagawa, Tsutomu; Tokunoh, Futoshi; and Yoshida, Shigekazu, 4,881,118, Cl. 357-79.000.

Yoshida, Takayuki; Fujii, Masao; and Sakuma, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Heat exchanger tube for evaporation or condensation. 4,880,054, Cl. 165-133.000.

Yoshida, Tomio: *See*—
Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, 4,880,874, Cl. 525-67.000.

Yoshida, Yasuaki, to Mitisubishi Denki Kabushiki Kaisha. Infrared ray detector. 4,880,979, Cl. 250-338.400.

Yoshihara, Masashi, to NEC Corporation. Antenna orientation adjusting device for earth station. 4,881,081, Cl. 342-359.000.

Yoshihashi, Sakashi: *See*—
Akiyama, Yoshinobu; Yoshihashi, Sakashi; and Sakauchi, Iwao, 4,880,659, Cl. 426-656.000.

Yoshikawa, Kuniyoshi, to Kabushiki Kaisha Toshiba. Semiconductor device. 4,881,108, Cl. 357-23.500.

Yoshikawa, Masato; Kusano, Yukihiro; Naito, Kazuo; Honda, Toshio; and Hata, Tomonobu, to Bridgestone Corporation. Surface treatment method. 4,880,515, Cl. 204-192.120.

Yoshikawa, Yasuhiro: *See*—
Ueyama, Shinichiro; Yoshikawa, Yasuhiro; and Okamoto, Tetsuhiko, 4,880,905, Cl. 528-399.000.
Yoshimura, Masakiyo: *See*—
Homan, Morio; Sugie, Nizo; Yoshimura, Masakiyo; and Shirakawa, Yoshikazu, 4,880,702, Cl. 428-354.000.
Yoshimura, Shoji: *See*—
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Yoshinaga, Jun: *See*—
Nishigaki, Shinichi; Nakamura, Takeaki; Yoshinaga, Jun; Kanno, Masahide; Yabe, Hisao; Yokoi, Takeshi; Oozeki, Kazuhiko; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,879,992, Cl. 128-6.000.
Yoshinaga, Kazuo; Katagiri, Kazuharu; and Shinjo, Kenji, to Canon Kabushiki Kaisha. Lactic acid derivative, liquid crystal composition containing same and liquid crystal device. 4,880,560, Cl. 252-299.010.
Yoshino, Masahiro: *See*—
Seto, Yutaka; Suzuki, Shigehiro; Suzuki, Tomohiro; Fujita, Atsushi; Tai, Akira; and Yoshino, Masahiro, 4,881,103, Cl. 355-251.000.
Yoshioka, Kenichiro; and Hisamitsu, Hironori, to Mazda Motor Corporation. Molding installation using die. 4,880,792, Cl. 425-190.000.
Yoshioka, Naoki: *See*—
Kanamori, Hiroo; Tanaka, Gotaro; Kyoto, Michihisa; Yoshioka, Naoki; and Mizutani, Futoshi, 4,880,452, Cl. 65-3.120.
Yoshioka, Shogo: *See*—
Kuwabara, Youhei; Asaoka, Teruo; Yoshioka, Shogo; and Sugiyama, Haruki, 4,880,509, Cl. 204-129.200.
Yoshioka, Teruo; Nakano, Shoji; and Sato, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. An assembling jig for assembling a fly wheel and an ignition coil to an engine. 4,879,797, Cl. 29-240.000.
Yoshioka, Yasuhiro: *See*—
Tazaki, Satoru; and Yoshioka, Yasuhiro, 4,881,274, Cl. 455-296.000.
Yoshiya, Tsutomu: *See*—
Imoto, Katsuyuki; Takase, Akihiko; Takai, Atsushi; Aoki, Satoshi; Yoshiya, Tsutomu; and Yamada, Shoji, 4,880,289, Cl. 350-96.180.
Young, Steven A.: *See*—
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., 4,880,871, Cl. 525-43.000.
Yuasa, Toshiya: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,881,084, Cl. 346-1.100.
Yuito, Isamu; Moriwaki, Eijin; Shiiki, Kazuo; Hamakawa, Yoshihiro; and Takano, Hisashi, to Hitachi, Ltd. Thin film magnetic head. 4,881,144, Cl. 360-125.000.
Yumoto, Akira: *See*—
Watanabe, Kazuo; and Yumoto, Akira, 4,881,203, Cl. 365-203.000.
Yusa, Hideo: *See*—
Matsuda, Masami; Funabashi, Kiyomi; Nishi, Takashi; Komori, Itaru; Baba, Tsutomu; Yusa, Hideo; Uchida, Shunsuke; Adachi, Tetsuro; Ohsumi, Katsumi; and Sato, Tomohiro, 4,880,595, Cl. 376-313.000.
Yves Saint Laurent Parfumes: *See*—
Jumel, Bernard; and Pileur, Charles, 4,880,139, Cl. 220-337.000.
Zalevsky, Harvey A.; and Leah, David A. Device for cleaning a cooking grate. 4,879,779, Cl. 15-104.920.
Zander, Hans-Gunter; Bornefeld, Horst; and Holle, Bernd-Michael, to Bayer Aktiengesellschaft. Process and device for micronizing solid matter in jet mills. 4,880,169, Cl. 241-5.000.
Zanzig, Jurgen: *See*—
Meschkat, Peter; and Zanzig, Jurgen, 4,881,262, Cl. 379-402.000.
Zarowitz, Barbara J.; and Twyman, Diana L. Method for determining therapeutic drug dosage using bioelectrical resistance and reactance measurements. 4,880,014, Cl. 128-734.000.
Zaslawsky, Abraham, to Eta sa Fabriques d'Ebauches. Watch movement having date and phases of the moon indicators. 4,881,213, Cl. 368-15.000.
Zechner, Werner: *See*—
Jerlich, Werner J.; Kugler, Alfred; Kaiserfeld, Hans; Schulhofer, Anton; and Zechner, Werner, 4,880,481, Cl. 148-325.000.
Zehner, George F., Jr., to Uarco Incorporated. Multiple ply business form. 4,880,255, Cl. 282-11.50A.
Zeiler, Hans-Joachim: *See*—
Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,880,795, Cl. 514-202.000.
Zeller, Gary P.: *See*—
Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., 4,880,283, Cl. 305-35.00R.
Zenith Electronics Corporation: *See*—
Adler, Robert; Fogelson, Mark; and Kaplan, Sam, 4,880,665, Cl. 427-126.300.
Zestful Holdings Limited: *See*—
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Ziche, Horst: *See*—
Wahle, Bernd; Anzinger, Hermann; Ziche, Horst; and Schinski, Erhard, 4,880,898, Cl. 528-272.000.
Ziegler, Walter: *See*—
Hub, Hans-Henning; Simon, Georg N.; Heinz, Gerhard; Ziegler, Walter; and Sadlowski, Juergen, 4,880,876, Cl. 525-67.000.
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Leemkuil, Hendrik; and Zilber, Eugene A., 4,880,099, Cl. 198-371.000.
Zilliox, Patricia: *See*—
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Zimmermann, Wolfgang; and Harreus, Albrecht, to Hoechst Aktiengesellschaft. Polymer granulate, a process for its preparation, and its use. 4,880,870, Cl. 524-31.000.
Zinser Textilmaschinen GmbH: *See*—
Bothner, Jakob, 4,879,872, Cl. 57-137.000.
Zisapel, Nava; and Laudon, Moshe. Melatonin antagonist. 4,880,826, Cl. 514-415.000.
Zmijewski, Milton J.: *See*—
Fayerman, Jeffrey T.; Jones, Michael D.; Michel, Karl H.; Yao, Raymond C.; and Zmijewski, Milton J., 4,880,735, Cl. 435-71.000.
Zolock, Michael J., to Micro Motion, Incorporated. Coriolis mass flow rate meter having four pulse harmonic rejection. 4,879,911, Cl. 73-861.380.
Zun, Hong-Fu. Releasable swivel lock assembly for a canopy support of a stroller. 4,880,331, Cl. 403-24.000.
Zwarun, Andrew A.; and Price, Gail L., to Edward Weck Incorporated. Ink formulation for monitoring sterilization processes. 4,880,466, Cl. 106-21.000.
501 Bellwether, Inc.: *See*—
Jenkins, John W., 4,880,037. Cl. 139-439.000.
501 Herberts Gesellschaft mit Beschrankter: *See*—
Gobel, Armin; Graff, Knut; Meier, Hans-Ulrich; and Patzschke, Hans-Peter, 4,880,867, Cl. 524-507.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF NOVEMBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aoki, Masayuki: *See*—
Kiritani, Masataka; Matsukawa, Hiroharu; and Aoki, Masayuki, Re. 33,113, Cl. 503-213.000.

Belmont Textile Machinery Company: *See*—
Niederer, Kurt W., Re. 33,111, Cl. 242-18.00A.

Doerr, Erwin: *See*—
Wood, Prentice J.; and Doerr, Erwin, Re. 33,110, Cl. 229-117.130.

Durham, Timothy N. Apparatus for housing and deploying a radar detector in an automotive vehicle. Re. 33,112, Cl. 296-37.700.

Fuji Photo Film Co., Ltd.: *See*—
Kiritani, Masataka; Matsukawa, Hiroharu; and Aoki, Masayuki, Re. 33,113, Cl. 503-213.000.

Kiritani, Masataka; Matsukawa, Hiroharu; and Aoki, Masayuki, to Fuji Photo Film Co., Ltd. Pressure sensitive recording paper. Re. 33,113, Cl. 503-213.000.

Matsukawa, Hiroharu: *See*—
Kiritani, Masataka; Matsukawa, Hiroharu; and Aoki, Masayuki, Re. 33,113, Cl. 503-213.000.

Mead Corporation, The: *See*—
Wood, Prentice J.; and Doerr, Erwin, Re. 33,110, Cl. 229-117.130.

Niederer, Kurt W., to Belmont Textile Machinery Company. Method and apparatus for automatically doffing and donning take-up packages on a winder. Re. 33,111, Cl. 242-18.00A.

Wood, Prentice J.; and Doerr, Erwin, to Mead Corporation, The. Carrying handle for a can carton. Re. 33,110, Cl. 229-117.130.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Buell, Kenneth B., to Procter & Gamble Company, The. Disposable garment with breatheable leg cuffs. B1 4,636,207, 11-14-89, Cl. 604-370.000.

Canon Kabushiki Kaisha: *See*—
Suzki, Akiyoshi; and Hirabayashi, Yoichi, B1 4,199,219, Cl. 350-6.100.

Dial-A-Channel, Inc.: *See*—
Doumit, Joseph A.; and Weiblen, Robert E., B1 4,203,130, Cl. 358-1.000.

Doumit, Joseph A.; and Weiblen, Robert E., to Dial-A-Channel, Inc. Information displaying system. B1 4,203,130, 11-14-89, Cl. 358-1.000.

Draai, Willem T.: *See*—
van Cooten, Robertus; Simons, Dick; Witteveen, Bontko; Draai, Willem T.; van Striphout, Johannes G. V.; and Huijben, Martinus J., B1 4,704,621, Cl. 346-153.100.

Eaton Corporation: *See*—
King, Monroe L., B1 4,514,636, Cl. 250-443.100.

Grant, Louis A.; and Trunzo, Arthur F., to Standard Steel Sponge. Drapable consumable heat retention shield for hot metal cars. B1 4,424,956, 11-14-89, Cl. 266-248.000.

Hirabayashi, Yoichi: *See*—
Suzki, Akiyoshi; and Hirabayashi, Yoichi, B1 4,199,219, Cl. 350-6.100.

Huijben, Martinus J.: *See*—
van Cooten, Robertus; Simons, Dick; Witteveen, Bontko; Draai, Willem T.; van Striphout, Johannes G. V.; and Huijben, Martinus J., B1 4,704,621, Cl. 346-153.100.

King, Monroe L., to Eaton Corporation. Ion treatment apparatus. B1 4,514,636, 11-14-89, Cl. 250-443.100.

McDonald, Charles H. Elastomeric pavement repair composition for pavement failure and a method of making the same. B1 3,891,585, 11-14-89, Cl. 523-307.000.

OCE-Nederland B.V.: *See*—
van Cooten, Robertus; Simons, Dick; Witteveen, Bontko; Draai, Willem T.; van Striphout, Johannes G. V.; and Huijben, Martinus J., B1 4,704,621, Cl. 346-153.100.

Procter & Gamble Company, The: *See*—
Buell, Kenneth B., B1 4,636,207, Cl. 604-370.000.

Rondeau, Henry S., to Rondeau, Virginia C., Executrix of State of Henry S. Rondeau. Spray bonding of nickel aluminum and nickel titanium alloys. B1 4,027,367, 11-14-89, Cl. 428-652.000.

Rondeau, Virginia C.: *See*—
Rondeau, Henry S., B1 4,027,367, Cl. 428-652.000.

Silicon Technology Corporation: *See*—
Steere, Robert E., Jr., B1 4,420,909, Cl. 51-73.00R.

Simons, Dick: *See*—
van Cooten, Robertus; Simons, Dick; Witteveen, Bontko; Draai, Willem T.; van Striphout, Johannes G. V.; and Huijben, Martinus J., B1 4,704,621, Cl. 346-153.100.

Standard Steel Sponge: *See*—
Grant, Louis A.; and Trunzo, Arthur F., B1 4,424,956, Cl. 266-248.000.

Steere, Robert E., Jr., to Silicon Technology Corporation. Wafering system. B1 4,420,909, 11-14-89, Cl. 51-73.00R.

Suzki, Akiyoshi; and Hirabayashi, Yoichi, to Canon Kabushiki Kaisha. Device for scanning an object with a light beam. B1 4,199,219, 11-14-89, Cl. 350-6.100.

Trunzo, Arthur F.: *See*—
Grant, Louis A.; and Trunzo, Arthur F., B1 4,424,956, Cl. 266-248.000.

van Cooten, Robertus; Simons, Dick; Witteveen, Bontko; Draai, Willem T.; van Striphout, Johannes G. V.; and Huijben, Martinus J., to OCE-Nederland B.V. Printing device. B1 4,704,621, 11-14-89, Cl. 346-153.100.

van Striphout, Johannes G. V.: *See*—
van Cooten, Robertus; Simons, Dick; Witteveen, Bontko; Draai, Willem T.; van Striphout, Johannes G. V.; and Huijben, Martinus J., B1 4,704,621, Cl. 346-153.100.

Weiblen, Robert E.: *See*—
Doumit, Joseph A.; and Weiblen, Robert E., B1 4,203,130, Cl. 358-1.000.

Witteveen, Bontko: *See*—
van Cooten, Robertus; Simons, Dick; Witteveen, Bontko; Draai, Willem T.; van Striphout, Johannes G. V.; and Huijben, Martinus J., B1 4,704,621, Cl. 346-153.100.

LIST OF DESIGN PATENTEES

Adleman, Larry G.; and Wanner, Vernon W., to Greenlee Textron, Inc. Conduit and tube bender housing. 304,590, 11-14-89, Cl. D15-123.000.

All-Weather Industries, Inc.: *See*—
Werthman, Harold E., 304,617, Cl. D25-48.000.

Aloys F. Dornbracht GmbH & Co. KG: *See*—
Lathrop, Bethany, 304,609, Cl. D23-238.000.

Alskog, Bjorn M. Pen. 304,601, 11-14-89, Cl. D19-49.000.

Alvarado, Welester G., to Joico Laboratories, Inc. Cuticle stick. 304,628, 11-14-89, Cl. D28-57.000.

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Danielson, David C.; Hartmann, James J.; McGarvey, John N.; Tilley, Alvin R.; and Wuerz, John M., 304,587, Cl. D14-244.000.

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Avia Group International, Inc.: *See*—
Selbiger, Lawrence; and Backus, Peter P., 304,516, Cl. D2-314.000.

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Selbiger, Lawrence; and Backus, Peter P., 304,516, Cl. D2-314.000.

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Baisch, Herbert: *See*—
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Banko, Ronald C.; and Nattress, Robert H., to InterMetro Industries Corporation. Side-loading dish and tray cart. 304,634, 11-14-89, Cl. D34-14.000.

Bardwell, David: *See*—
Dunlap, Kenneth W.; and Bardwell, David, 304,616, Cl. D24-24.000.

Barrett, William H.; Gregory, Joseph A.; Mohr, Lisa M.; and Schaum, David L., to International Business Machines Corporation. Cart. 304,635, 11-14-89, Cl. D34-19.000.

Batzel, Charles. Support pad for a recreational vehicle jack or the like. 304,575, 11-14-89, Cl. D34-31.000.

Beckerer, Frank S., Jr. Boat window. 304,572, 11-14-89, Cl. D12-317.000.

Black & Decker Inc.: *See*—
Seiffert, Florian, 304,541, Cl. D7-309.000.
Somers, Robert I.; and Gierke, Martin P., 304,543, Cl. D8-61.000.

Blaser, Dean B., to Potter, Inc. Display tray for fruit or the like. 304,536, 11-14-89, Cl. D7-27.000.

Bourassa, Marcel J. Cremation urn display stand. 304,641, 11-14-89, Cl. D99-5.000.

Bridgestone Corporation: *See*—
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Bush, Paul; and Anderson, Bruce O., to Bush Industries, Inc. Desk. 304,530, 11-14-89, Cl. D6-422.000.

Byrns, James E. Insulated can holder. 304,538, 11-14-89, Cl. D7-77.000.

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Campbell, Terry A. Combined earring stand and mirror. 304,532, 11-14-89, Cl. D6-469.000.

Campbell, Terry A., to Master Link Marketing Inc. Earring stand. 304,533, 11-14-89, Cl. D6-469.000.

Caretta, Renato, to Pirelli Coordinamento Pneumatici S.p.A. Tire. 304,561, 11-14-89, Cl. D12-147.000.

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Cattach, Keith A., to Mallinckrodt Australia Pty. Ltd. Container. 304,546, 11-14-89, Cl. D9-305.000.

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Chiku, Akira: *See*—
Fujiyama, Yoshiyuki; Ogawara, Sumio; Chiku, Akira; Kumano, Toshihiro; and Okiyama, Yoshitatsu, 304,579, Cl. D14-118.000.

Clark, Larry M., to L.A. Gear, Inc. Shoe sole. 304,520, 11-14-89, Cl. D2-320.000.

Clark, Larry M., to L.A. Gear, Inc. Shoe out sole. 304,521, 11-14-89, Cl. D2-320.000.

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Desgrippes, Joel, 304,551, Cl. D9-385.000.

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Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., to Rorer Pharmaceutical Corporation. Pharmaceutical tablet. 304,626, 11-14-89, Cl. D28-2.000.

Cunnane, Mark; and Delaney, Richard P., to Security Imprinter Corporation. Motor driven imprinter. 304,599, 11-14-89, Cl. D18-14.000.

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Lane, Wendell C., 304,566, Cl. D12-155.000.
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Danielson, David C.; Hartmann, James J.; McGarvey, John N.; Tilley, Alvin R.; and Wuerz, John M., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Telephone dialer adjunct. 304,587, 11-14-89, Cl. D14-244.000.

Davis, Victor G., to Foam Fabricators Ltd. Stackable tray. 304,639, 11-14-89, Cl. D34-40.000.

Delaney, Richard P.: *See*—
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De Lucchi, Michele, to Artemide S.p.A. Adjustable wall lamp. 304,624, 11-14-89, Cl. D26-65.000.

Demarest, Scott W., to S. C. Johnson & Son, Inc. Squeeze bottle and dispensing cap. 304,550, 11-14-89, Cl. D9-377.000.

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Desgrippes, Joel, to Comptoir Nouveau De La Parfumerie, S.A. Perfume bottle or the like. 304,551, 11-14-89, Cl. D9-385.000.

Dexide, Inc.: *See*—
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Dillner, James M.; and Saint, Nathanael, to Graco Metal Products Inc. Foldable playyard. 304,523, 11-14-89, Cl. D6-391.000.

Dinerman, Edward V. Combined flower vases and holder. 304,554, 11-14-89, Cl. D11-147.000.

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Fan, Yung W., to Mee Tung Manufacturing Company Limited. Toy gun. 304,604, 11-14-89, Cl. D21-147.000.

Fay, James E., III, to Kimberly-Clark Corporation. Charcoal fuel article. 304,574, 11-14-89, Cl. D13-3.200.

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Hoogesteger, Paul A., to Cambridge Instruments, Inc. Protective cover for a rotatable turret assembly and objectives of an inverted microscope. 304,592, 11-14-89, Cl. D16-131.000.
Hoszowski, Andrew K., to Moeller Manufacturing Co., Inc. Swim platform. 304,573, 11-14-89, Cl. D12-318.000.
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Jokl, Jane A., to International Business Machines Corporation. Thermal printer specification. 304,598, 11-14-89, Cl. D18-13.000.
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Jun, Seo Y. Ventilating cover for container. 304,636, 11-14-89, Cl. D34-28.000.
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Kano, Kenichi, to Sony Corporation. Reel for a magnetic tape cassette. 304,585, 11-14-89, Cl. D14-122.000.
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Lathrop, Bethany, to Aloys F. Dornbracht GmbH & Co. KG. Faucet with a rotatable lever for a wash bowl. 304,609, 11-14-89, Cl. D23-238.000.
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Scheid, William J.; Toth, Richard J.; and Schwendeman, Robert J., 304,577, Cl. D14-106.000.
Nakaizumi, Hiroshi, to Sony Corporation. Magnetic tape cassette. 304,581, 11-14-89, Cl. D14-121.000.
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Banko, Ronald C.; and Nattress, Robert H., 304,634, Cl. D34-14.000.
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Brunger, Ronald N.; and Reynard, Larry N., 304,569, Cl. D12-172.000.
Newman, Matthew S. Basket or similar article. 304,640, 11-14-89, Cl. D34-44.000.
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Fujiyama, Yoshiyuki; Ogawara, Sumio; Chiku, Akira; Kumano, Toshihiro; and Okiyama, Yoshitatsu, 304,579, Cl. D14-118.000.
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Saegusa, Masahito; Hashimoto, Kazunori; Ohwada, Takashi; Kawakatsu, Yoshihiro; Ohuchi, Katsubumi; Endo, Hiroshi; and Yamashita, Taichiro, 304,578, Cl. D14-118.000.
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Fujiyama, Yoshiyuki; Ogawara, Sumio; Chiku, Akira; Kumano, Toshihiro; and Okiyama, Yoshitatsu, 304,579, Cl. D14-118.000.
O'Neil, William J., Jr.: *See—*
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Pirelli Coordinamento Pneumatici S.p.A.: *See—*
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Mezzanotte, Mario, 304,560, Cl. D12-146.000.
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Hiilko, Steven E., 304,593, Cl. D16-131.000.
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Brown, Paul D.; and Kittle, Christopher, 304,518, Cl. D2-314.000.
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Miller, David E., 304,519, Cl. D2-314.000.
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Filice, Gary, 304,608, Cl. D21-230.000.
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Goto, Tetsuya, 304,596, Cl. D16-217.000.
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Anderson, Robert L., 304,591, Cl. D15-138.000.
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White, O. Timothy, 304,535, Cl. D6-516.000.
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Demarest, Scott W., 304,550, Cl. D9-377.000.
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Sakurai, Sachie, to Brother Kogyo Kabushiki Kaisha. Ink ribbon cassette. 304,597, 11-14-89, Cl. D18-12.000.
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Miller, Virgil, 304,527, Cl. D6-381.000.
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Barrett, William H.; Gregory, Joseph A.; Mohr, Lisa M.; and Schaum, David L., 304,635, Cl. D34-19.000.
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Cunnane, Mark; and Delaney, Richard P., 304,599, Cl. D18-14.000.
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Skalka, Gerald P., to Victor Stanley, Inc. Covered trash can holder. 304,632, 11-14-89, Cl. D34-6.000.
Sloan, Donald G. Coin organizer. 304,643, 11-14-89, Cl. D99-34.000.
Somers, Robert I.; and Gierke, Martin P., to Black & Decker Inc. Battery-operated screwdriver or similar article. 304,543, 11-14-89, Cl. D8-61.000.
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Enomoto, Haruyuki, 304,580, Cl. D14-121.000.
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Kano, Kenichi, 304,585, Cl. D14-122.000.
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Nakaizumi, Hiroshi, 304,582, Cl. D14-121.000.
Nakaizumi, Hiroshi, 304,583, Cl. D14-121.000.
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Freadman, Tommyca; and Castagna, John F., 304,586, Cl. D14-114.000.
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Lindstrom, Albert K.; Strader, David R.; and Henley, George S., 304,570, Cl. D12-315.000.

Lindstrom, Albert K.; Strader, David R.; and Henley, George S., 304,571, Cl. D12-315.000.
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Ochiai, Kiyoshi, 304,557, Cl. D12-146.000.
Yamada, Munemitsu, 304,559, Cl. D12-146.000.
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Kitts, Keith D.; and Hand, James C., 304,525, Cl. D4-115.000.
Sylvan, Richard: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 304,528, Cl. D6-411.000.
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Danielson, David C.; Hartmann, James J.; McGarvey, John N.; Tilley, Alvin R.; and Wuerz, John M., 304,587, Cl. D14-244.000.
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Conaway, Robert M., 304,610, Cl. D23-207.000.
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Wanner, Vernon W.: *See*—
Adleman, Larry G.; and Wanner, Vernon W., 304,590, Cl. D15-123.000.
Weidman, Richard C.; and Weidman, W. Jeffrey. Suspenders. 304,522, 11-14-89, Cl. D2-626.000.
Weidman, W. Jeffrey: *See*—
Weidman, Richard C.; and Weidman, W. Jeffrey, 304,522, Cl. D2-626.000.
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Williamson, Ian M.: *See*—
Stackhouse, Wyman H.; and Williamson, Ian M., 304,612, Cl. D23-365.000.
Wuerz, John M.: *See*—
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Kido, Shigeaki; Isozaki, Sadao; and Yajima, Yasuko, 304,564, Cl. D14-151.000.
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Yamamoto, Masato, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera lens. 304,594, 11-14-89, Cl. D16-134.000.
Yamashita, Taichiro: *See*—
Saegusa, Masahito; Hashimoto, Kazunori; Ohwada, Takashi; Kawakatsu, Yoshihiro; Ohuchi, Katsubumi; Endo, Hiroshi; and Yamashita, Taichiro, 304,578, Cl. D14-118.000.
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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 14, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

24	4,879,765
101	4,879,766
243 B	4,879,767
268	4,879,768
312	4,879,769
441	4,879,770

CLASS 4

191	4,879,771
506	4,879,772
612	4,879,773

CLASS 5

8	4,879,774
400	4,879,775
436	4,879,776
453	4,879,777

CLASS 8

182	4,880,433
188	4,880,430
549	4,880,431
	4,880,434
647	4,880,432

CLASS 12

146 D	4,879,778

CLASS 15

104.92	4,879,779
105.5	4,879,780
110	4,879,781
210 A	4,879,782
250.21	4,879,783
322	4,879,784

CLASS 16

82	4,879,785
341	4,879,786

CLASS 24

712.2	4,879,787

CLASS 26

94	4,879,788

CLASS 27

11	4,879,789

CLASS 29

1.2	4,879,790
148.4 D	4,879,791
156.4 R	4,879,792
156.8 R	4,879,793
159.1	4,879,794
214	4,879,795
	4,879,796
240	4,879,797
434	4,879,798
447	4,879,799
450	4,879,800
455.1	4,879,801
568	4,879,802
598	4,879,803
605	4,879,804
622	4,879,805
623.5	4,880,435
741	4,879,806
828	4,879,807
845	4,879,808
860	4,879,809
861	4,879,810

CLASS 30

89	4,879,811

CLASS 33

1 MP	4,879,812
201	4,879,813
234	4,879,814
293	4,879,815
295	4,879,816
502	4,879,817
646	4,879,818
833	4,879,819

CLASS 34

71	4,879,820

CLASS 36

44	4,879,821
119	4,879,822

CLASS 40

124.1	4,879,823
152.1	4,879,824
513	4,879,825
551	4,879,826

CLASS 42

23	4,879,827
50	4,879,828
87	4,879,829

CLASS 43

9.7	4,879,830
17.6	4,879,831
25.2	4,879,832
26.1	4,879,833
43.12	4,879,834
44.83	4,879,835
64	4,879,836
124	4,879,837

CLASS 44

7.3	4,880,436
57	4,880,437

CLASS 47

45	4,879,838
57.6	4,879,839
58	4,879,840
59	4,879,841

CLASS 48

69	4,880,438
197 R	4,880,439

CLASS 49

141	4,879,842
158	4,879,843

CLASS 51

31	4,879,844
73 R	B1 4,420,909
98.5	4,879,845
137	4,879,846
170 R	4,879,847

CLASS 52

8	4,879,848
10	4,879,849
82	4,879,850
169.5	4,879,851
	4,879,852
208	4,879,853
238.1	4,879,854
309.11	4,879,855
403	4,879,856
	4,879,857
741	4,879,858
	4,879,859

CLASS 53

247	4,879,860
435	4,879,861
438	4,879,862
557	4,879,863
559	4,879,864

CLASS 54

66	4,879,865
71	4,879,866

CLASS 55

16	4,880,440
	4,880,441
	4,880,442
26	4,880,443
36	4,880,444
68	4,880,445
71	4,880,446
94	4,880,447
103	4,880,448
170	4,880,449
237	4,880,451
269	4,880,450

CLASS 56

11.1	4,879,867
11.2	4,879,868
12.7	4,879,869
13.6	4,879,870
239	4,879,871

CLASS 57

137	4,879,872
413	4,879,873

CLASS 60

259	4,879,874
588	4,879,875

CLASS 62

6	4,879,876
89	4,879,877
187	4,879,878
202	4,879,879
406	4,879,880
447	4,879,881

CLASS 63

4	4,879,882
15.7	4,879,883

CLASS 65

3.12	4,880,452
23	4,880,453
24	4,880,454

CLASS 66

14	4,879,884
54	4,879,885
151	4,879,886

CLASS 68

16	4,879,887
18 C	4,879,888

CLASS 70

56	4,879,889

CLASS 71

28	4,880,455
88	4,880,456
92	4,880,457

CLASS 72

62	4,879,890
254	4,879,891
290	4,879,892
402	4,879,893
405	4,879,894

CLASS 73

4 R	4,879,895
46	4,879,896
59	4,879,897
118.2	4,879,898
147	4,879,899
155	4,879,900
168	4,879,901
304 R	4,879,902
431	4,879,903
517 R	4,879,904
579	4,879,905
826	4,879,906
861.05	4,879,907
861.23	4,879,908
861.24	4,879,909
861.37	4,879,910
861.38	4,879,911
861.61	4,879,912
862.04	4,879,913
862.59	4,879,914
864.74	4,879,915
865.8	4,879,916
866	4,879,917

CLASS 74

5.47	4,879,918
337.5	4,879,919
465	4,879,920
467	4,879,921
500.5	4,879,922
552	4,879,923
799	4,879,924
867	4,879,925

CLASS 75

35	4,880,458
	4,880,459
236	4,880,460
238	4,880,461
253	4,880,462
257	4,880,463

CLASS 81

9.51	4,879,926
56	4,879,927
488	4,879,928

CLASS 82

110	4,879,929
158	4,879,930

CLASS 83

23	4,879,931
30	4,879,932
76.1	4,879,933
76.9	4,879,934
748	4,879,935
842	4,879,936

CLASS 84

95.2	4,879,938
240	4,879,939
322	4,879,940
699	4,879,937

CLASS 89

1.14	4,879,941
14.3	4,879,942

CLASS 91

224	4,879,943
516	4,879,944
518	4,879,945

CLASS 99

453	4,879,946

CLASS 101

93.04	4,879,947
114	4,879,948
157	4,879,949
217	4,879,950
363	4,879,951

CLASS 102

331	4,879,952
507	4,879,953

CLASS 106

1.05	4,880,464
20	4,880,465
21	4,880,466
85	4,880,467
98	4,880,468
203	4,880,469
271	4,880,470
286.6	4,880,471
493	4,880,472

CLASS 108

6	4,879,954
50	4,879,955
53.3	4,879,956

CLASS 109

79	4,879,957

CLASS 110

245	4,879,958
264	4,879,959

CLASS 112

291	4,879,960

CLASS 114

102	4,879,961
188	4,879,962
363	4,879,963

CLASS 116

28 R	4,879,964
209	4,879,965

CLASS 118

207	4,879,966
259	4,879,967
300	4,879,968
638	4,879,969
719	4,879,970

CLASS 119

14.03	4,879,971
109	4,879,972

CLASS 122

379	4,879,973

CLASS 123

51 A	4,879,974
52 M	4,879,975
90.31	4,879,977
90.67	4,879,978
136	4,880,856
190 BB	4,879,979
193 H	4,879,980
198 C	4,879,981
339	4,879,982
	4,879,983
450	4,879,984
501	4,879,985
571	4,879,986
651	4,879,976

CLASS 124

25	4,879,987
41 A	4,879,988
79	4,879,989

CLASS 126

25 R	4,879,990

CLASS 127

37	4,880,473

CLASS 128

6	4,879,991
	4,879,992
24 A	4,879,993
70	4,879,994
200.21	4,879,997
201.11	4,879,995
202.26	4,879,996
205.24	4,879,998
207.14	4,879,999
303 R	4,880,000
303.1	4,880,001
335.5	4,880,002
374	4,880,003
419 PG	4,880,004
	4,880,005
630	4,880,006
653	4,880,007
654	4,880,008
660.09	4,880,009
661.01	4,880,010
662.06	4,880,011
663.01	4,880,012
681	4,880,013
734	4,880,014
751	4,880,015
885	4,880,016
898	4,880,017

CLASS 131

375	4,880,018

CLASS 132

270	4,880,019
308	4,880,020

CLASS 134

21	4,880,474
62	4,880,021
120	4,880,022

CLASS 135

25 R	4,880,023
101	4,880,024

CLASS 137

1	4,880,025
234.6	4,880,026
247.25	4,880,027
315	4,880,028
329.06	4,880,029
460	4,880,030
625.12	4,880,031
625.19	4,880,032
625.65	4,880,033

CLASS 138

40	4,880,034
99	4,880,035
137	4,880,036

CLASS 139

439	4,880,037

CLASS 140

93.6	4,880,038

CLASS 141

1	4,880,039
5	4,880,040
167	4,880,041

CLASS 144

372	4,880,042

CLASS 148

141	4,880,477
248	4,880,478
253	4,880,476
320	4,880,479
	4,880,480
325	4,880,481
403	4,880,482

CLASS 149

6	4,880,483

CLASS 152

526	4,880,043

CLASS 156

51	4,880,484
108	4,880,485
273.5	4,880,486
327	4,880,487
344	4,880,488
345	4,880,489
541	4,880,490
584	4,880,491
610	4,880,492
628	4,880,493
633	4,880,494
642	4,880,495
643	4,880,496

CLASS 160

84.1	4,880,044
	4,880,045
194	4,880,046

CLASS 162

135	4,880,497
164.6	4,880,498
198	4,880,499
279	4,880,500
358	4,880,501
359	4,880,502

CLASS 164

45	4,880,047
342	4,880,048

CLASS 165

6	4,880,049
41	4,880,050
45	4,880,051
47	4,880,503
104.14	4,880,052
104.26	4,880,053
133	4,880,054
167	4,880,055

CLASS 166

51	4,880,056
267	4,880,057
289	4,880,058
332	4,880,059
336	4,880,060
348	4,880,061
371	4,880,062

CLASS 169

37	4,880,063

CLASS 173

12	4,880,064

CLASS 174

72 A	4,880,943
138 E	4,880,944

CLASS 175

71	4,880,065
75	4,880,066
107	4,880,067
369	4,880,068

CLASS 177

211	4,880,069

CLASS 180

53.1	4,880,070
117	4,880,071
140	4,880,072
	4,880,073
142	4,880,074

219 4,880,075

CLASS 181

130 4,880,076
207 4,880,077
232 4,880,078

CLASS 182

107 4,880,079
155 4,880,080

CLASS 184

1.5 4,880,081

CLASS 187

134 4,880,082

CLASS 188

2 R 4,880,083
67 4,880,084
79.55 4,880,085
299 4,880,086
322.16 4,880,087
377 4,880,088

CLASS 190

18 R 4,880,089

CLASS 192

0.052 4,880,094
3.3 4,880,090
4,880,091
4 A 4,880,092
45.1 4,880,093
58 B 4,880,095

CLASS 194

206 4,880,096
239 4,880,097

CLASS 198

346.2 4,880,098
371 4,880,099
379 4,880,100
403 4,880,101
418.3 4,880,102
434 4,880,103
445 4,880,104
465.4 4,880,105
763 4,880,106
779 4,880,107
803.12 4,880,108
833 4,880,109

CLASS 200

61.54 4,880,945
144 B 4,880,947
148 A 4,880,946
151 4,880,948
501 4,880,949
547 4,880,950

CLASS 202

185.6 4,880,504

CLASS 203

60 4,880,505

CLASS 204

1.5 4,880,506
44.4 4,880,507
59 R 4,880,508
129.2 4,880,509
131 4,880,510
151 4,880,511
157.61 4,880,512
182.4 4,880,513
192.12 4,880,515
192.2 4,880,514
196 4,880,517
224 M 4,880,516
298 4,880,518
425 4,880,519

CLASS 205

311 4,880,977

CLASS 206

0.5 4,880,110
209.1 4,880,111
216 4,880,112
287 4,880,113
418 4,880,114
427 4,880,115
454 4,880,116
487 4,880,117
513 4,880,118
584 4,880,119

CLASS 208

46 4,880,520
120 4,880,521
216 PP 4,880,522
4,880,523
4,880,524
4,880,525
217 4,880,526
251 R 4,880,527
409 4,880,528

CLASS 209

3.1 4,880,120
167 4,880,529
268 4,880,532
380 4,880,530
702 4,880,121

CLASS 210

104 4,880,533
130 4,880,534
169 4,880,531
181 4,880,535
232 4,880,536
323.1 4,880,537
401 4,880,538
408 4,880,539
413 4,880,540
496 4,880,541
611 4,880,542
635 4,880,543
639 4,880,544
654 4,880,545
699 4,880,546
728 4,880,547
767 4,880,548
805 4,880,549

CLASS 211

70.6 4,880,122

CLASS 212

177 4,880,123
218 4,880,124

CLASS 215

11.3 4,880,125
100 R 4,880,126
252 4,880,127

CLASS 219

10.55 B 4,880,952
10.55 E 4,880,951
10.55 M 4,880,953
4,880,954
10.55 R 4,880,955
60 A 4,880,956
69.12 4,880,957
121.39 4,880,958
121.85 4,880,959
273 4,880,960
388 4,880,961
549 4,880,962

CLASS 220

3.9 4,880,128
70 4,880,129
83 4,880,131
4,880,132
85 H 4,880,133
85 K 4,880,130
85 P 4,880,134
85 VS 4,880,135
253 4,880,136
260 4,880,137
320 4,880,138
337 4,880,139
371 4,880,140
464 4,880,141

CLASS 222

56 4,880,142
135 4,880,143
173 4,880,144
192 4,880,145
4,880,146
195 4,880,147
4,880,148
207 4,880,149
346 4,880,150
394 4,880,151

CLASS 224

162 4,880,152

CLASS 228

2.5 4,880,153
122 4,880,154

CLASS 229

117.13 Re.33,110
125.09 4,880,155

CLASS 232

43.1 4,880,156

CLASS 235

449 4,880,963
462 4,880,964

CLASS 236

25 R 4,880,157

CLASS 238

8 4,880,158

CLASS 239

1 4,880,159
167 4,880,160
330 4,880,161
406 4,880,162
422 4,880,163
423 4,880,164
525 4,880,165
526 4,880,166
542 4,880,167
553.5 4,880,168

CLASS 241

5 4,880,169
4,880,170
46.11 4,880,171
101.2 4,880,172

CLASS 242

1.1 R 4,880,173
18 A Re.33,111
18 DD 4,880,174
35.5 R 4,880,175
35.6 E 4,880,176
47.01 4,880,177
58.1 4,880,178
71.1 4,880,179
71.8 4,880,180
74 4,880,181
117 4,880,182
125.1 4,880,183
130 4,880,184

CLASS 244

135 B 4,880,185
159 4,880,186
172 4,880,187
173 4,880,188
214 4,880,189

CLASS 246

107 4,880,190

CLASS 248

110 4,880,192
122 4,880,193
166 4,880,194
219.4 4,880,195
293 4,880,196
324 4,880,197
346 4,880,198
371 4,880,191
396 4,880,199
547 4,880,200
575 4,880,201
676 4,880,202

CLASS 249

24 4,880,203
219.2 4,880,204

CLASS 250

213 VT 4,880,965
216 4,880,974
221 4,880,967
4,880,968
4,880,969
227 4,880,970
4,880,971
231 R 4,880,966
4,880,972
253 4,880,973
306 4,880,975
310 4,880,976
332 4,880,978
338.4 4,880,979
353 4,880,980
369 4,880,981
385.1 4,880,983
443.1 B1 4,514,636
484.1 4,880,984
4,880,986
4,880,987
504 R 4,880,988
505.1 4,880,985
506.1 4,880,989
560 4,880,991
561 4,880,992
577 4,880,982
4,880,990

CLASS 251

30.02 4,880,205
129.21 4,880,206
337 4,880,207
356 4,880,208
363 4,880,209

CLASS 252

33 4,880,550
34 4,880,552
47.5 4,880,551
58 4,880,553
143 4,880,555
156 4,880,556
174.15 4,880,557
174.23 4,880,558
186.21 4,880,559
299.01 4,880,560
299.61 4,880,561
299.63 4,880,562
312 4,880,563
321 4,880,564
355 4,880,565
389.22 4,880,566
512 4,880,567
4,880,570
548 4,880,568
550 4,880,569

CLASS 256

26 4,880,210

CLASS 257

284 4,880,271

CLASS 260

404 4,880,572
420 4,880,573
428 4,880,574

CLASS 264

22 4,880,577
26 4,880,578
4,880,579
4,880,580
39 4,880,581
82 4,880,582
130 4,880,583
135 4,880,584
141 4,880,585
4,880,586
154 4,880,587
163 4,880,588
216 4,880,589
275 4,880,590
327 4,880,591
514 4,880,592
532 4,880,593

CLASS 266

44 4,880,211
94 4,880,212
248 B1 4,424,956

CLASS 267

64.27 4,880,213
136 4,880,214
140.1 4,880,215
4,880,216
167 4,880,217

CLASS 269

21 4,880,218
60 4,880,219
71 4,880,220
139 4,880,221
322 4,880,222

CLASS 271

293 4,880,223

CLASS 272

72 4,880,224
73 4,880,225
97 4,880,226
118 4,880,227
122 4,880,228
123 4,880,229
130 4,880,230

CLASS 273

1 GD 4,880,231
32 B 4,880,232
60 R 4,880,233
73 L 4,880,234
86 R 4,880,235
113 4,880,236
138 A 4,880,237
160 4,880,238
181 F 4,880,239
188 R 4,880,240
232 4,880,241
336 4,880,242
411 4,880,243

CLASS 277

174 4,880,244

CLASS 279

1 K 4,880,246
1 R 4,880,245
79 4,880,247

CLASS 280

47.35 4,880,248
253 4,880,249
414.1 4,880,250
613 4,880,251
618 4,880,252
804 4,880,253
808 4,880,254

CLASS 282

11.5 A 4,880,255

CLASS 283

92 4,880,256

CLASS 285

2 4,880,257
7 4,880,258
137.1 4,880,259
382.2 4,880,260

CLASS 290

2 4,880,993

CLASS 292

7 4,880,261
202 4,880,262
216 4,880,263
226 4,880,264

CLASS 294

86.4 4,880,265

CLASS 296

37.7 Re.33,112
37.9 4,880,266
56 4,880,267
65.1 4,880,268
190 4,880,269

CLASS 297

188 4,880,270
296 4,880,272
325 4,880,273
362 4,880,274
391 4,880,275
452 4,880,276
467 4,880,277

CLASS 299

79 4,880,278

CLASS 301

36 R 4,880,279
105 B 4,880,280
124 R 4,880,281

CLASS 303

116 4,880,282

CLASS 305

35 R 4,880,283

CLASS 307

219 4,880,994
270 4,880,995
425 4,880,996
443 4,880,997
446 4,880,998

CLASS 310

37 4,880,999
234 4,881,000
258 4,881,001
261 4,881,002
311 4,881,003

CLASS 312

263 4,880,284
312 4,880,285

CLASS 313

408 4,881,004
422 4,881,005
450 4,881,006
493 4,881,007
495 4,881,017
532 4,881,008
631 4,881,009

CLASS 315

111.81 4,881,010
209 R 4,881,012
209 SC 4,881,011
241 P 4,881,013
246 4,881,014
371 4,881,015
376 4,881,016

CLASS 318

9 4,881,018
68 4,881,019
569 4,881,021
626 4,881,020
800 4,881,022

CLASS 323

266 4,881,023
299 4,881,024

CLASS 324

61 R 4,881,025
71.1 4,881,026
107 4,881,027
127 4,881,028
158 R 4,881,029
209 4,881,030
233 4,881,031
309 4,881,032
4,881,033
318 4,881,034
320 4,881,035
329 4,881,036
425 4,881,037
426 4,881,038

CLASS 328

26 4,881,039
61 4,881,040
112 4,881,041

CLASS 329

326 4,881,042

CLASS 330

252 4,881,043
253 4,881,044
4,881,045
277 4,881,046
282 4,881,047

CLASS 331

14 4,881,048

CLASS 332

103 4,881,049

CLASS 333

24.1 4,881,052
185 4,881,050
208 4,881,051

CLASS 335

80 4,881,053
230 4,881,054

CLASS 337

404 4,881,055

CLASS 338

4 4,881,056
28 4,881,057

CLASS 340

326 4,881,058
511 4,881,060
568 4,881,061
677 4,881,062
693 4,881,063
709 4,881,064
710 4,881,065
719 4,881,066
735 4,881,069
750 4,881,067
766 4,881,068
825.05 4,881,074
825.440 4,881,073
870.02 4,881,070
870.020 4,881,072
870.13 4,881,071

CLASS 341

70 4,881,059
87 4,881,075
95 4,881,076

CLASS 342

26 4,881,077
155 4,881,078
194 4,881,079
357 4,881,080
359 4,881,081
432 4,881,082
459 4,881,083

CLASS 346

1.1 4,881,084
75 4,881,085
108 4,881,086
139 C 4,881,087
140 R 4,881,088
4,881,089
153.1 B1 4,704,621

CLASS 350

1.1 4,880,286
3.85 4,880,287
6.1 B1 4,199,219
96.12 4,880,288
96.18 4,880,289
96.20 4,880,290
96.21 4,880,291
128 4,880,292
269 4,880,293
4,880,294
354 4,880,295
4,880,296
355 4,880,297
414 4,880,298
415 4,880,299
618 4,880,300
636 4,880,301

CLASS 351

59 4,880,302

CLASS 353

122 4,880,303

CLASS 354

105 4,881,090
132 4,881,091
152 4,881,092
234.1 4,881,093
286 4,881,094
298 4,881,095
400 4,881,096
402 4,881,097
403 4,881,098

CLASS 355

45 4,881,099
53 4,881,100
204 4,881,101
243 4,881,102
251 4,881,103
309 4,881,104

CLASS 356

41 4,880,304
141 4,880,305
153 4,880,306
375 4,880,307
401 4,880,308
4,880,309
4,880,310

CLASS 357

23.4 4,881,105
4,881,107
4,881,119
4,881,120
23.5 4,881,108
23.8 4,881,106
25 4,881,109
30 4,881,110
34 4,881,111
47 4,881,112
51 4,881,113
54 4,881,114
64 4,881,115
74 4,881,116
4,881,117
79 4,881,118

CLASS 358

1 B1 4,203,130
10 4,881,121
88 4,881,122
111 4,881,124
141 4,881,125
160 4,881,126
213.19 4,881,127
228 4,881,128
296 4,881,131
4,881,132
299 4,881,133
328 4,881,134
335 4,881,135
434 4,881,129
443 4,881,130

CLASS 360

25 4,881,136
96.5 4,881,137
4,881,138
105 4,881,139
106 4,881,140
4,881,141
4,881,142
113 4,881,143
125 4,881,144
130.24 4,881,145
132 4,881,146

CLASS 361

118 4,881,147
172 4,881,148
328 4,881,149
383 4,880,594
392 4,881,150
531 4,881,151

CLASS 362

61 4,881,152
78 4,881,153
102 4,881,154
191 4,881,155
207 4,881,158
220 4,881,156
371 4,881,157

CLASS 363

58 4,881,159

CLASS 364

161 4,881,160
167.01 4,881,161
176 4,881,162
200 4,881,163
4,881,164
4,881,165
4,881,166
4,881,167
4,881,168
4,881,169
4,881,170
400 4,881,219
413.24 4,881,171
424.05 4,881,172
431.07 4,881,173
484 4,881,174
496 4,881,175
500 4,881,176
513 4,881,177
4,881,178
518 4,881,179
4,881,180
519 4,881,181
4,881,182
550 4,881,183
551.01 4,881,184
557 4,881,185
565 4,881,186
4,881,187
713 4,881,188
715.05 4,881,189
718 4,881,190
724.13 4,881,191
725 4,881,192
761 4,881,193
900 4,881,194
4,881,195
4,881,196
4,881,197

CLASS 365

12 4,881,198
189.01 4,881,199
189.04 4,881,200
189.09 4,881,201
200 4,881,202
203 4,881,203
222 4,881,205
227 4,881,206

CLASS 366

101 4,880,311
130 4,880,312
336 4,880,313

CLASS 367

31 4,881,207
35 4,881,208
52 4,881,209
143 4,881,211
152 4,881,212
173 4,881,210

CLASS 368

15 4,881,213

CLASS 369

44 4,881,214
4,881,215
46 4,881,204
54 4,881,216
132 4,881,217
289 4,881,218

CLASS 370

16 4,881,220
32.1 4,881,221
70 4,881,222
77 4,881,223
82 4,881,224
95.1 4,881,225
110.1 4,881,226

CLASS 371

9 4,881,227
19 4,881,228
20.1 4,881,230
20.4 4,881,229
37.4 4,881,232

CLASS 372

32 4,881,231
35 4,881,233
42 4,881,234
45 4,881,235
4,881,236
50 4,881,237
68 4,881,238

CLASS 373

70 4,881,239

CLASS 374

129 4,880,314

CLASS 375

4 4,881,243
15 4,881,240
36 4,881,244
38 4,881,241
4,881,245
84 4,881,246
118 4,881,242

CLASS 376

257 4,881,247
313 4,880,595
336 4,880,596
419 4,880,597

CLASS 377

17 4,881,248
60 4,881,249
4,881,250

CLASS 378

7 4,881,251
35 4,881,257

CLASS 379

38 4,881,252
54 4,881,253
58 4,881,258
4,881,259
76 4,881,260
144 4,881,254
215 4,881,261
402 4,881,262
412 4,881,255
449 4,881,256

CLASS 380

21 4,881,263
25 4,881,264

CLASS 381

40 4,881,267
43 4,881,266
90 4,881,265
104 4,881,123

CLASS 382

7 4,881,268
8 4,881,269
17 4,881,270

CLASS 383

39 4,880,315
75 4,880,316

CLASS 384

45 4,880,317
125 4,880,318
215 4,880,319
4,880,320

CLASS 400

64 4,880,321
167 4,880,322
196.1 4,880,323
241 4,880,324
249 4,880,325

CLASS 401

123 4,880,326

CLASS 402

73 4,880,327

CLASS 403

1 4,880,328
24 4,880,331
134 4,880,329
152 4,880,330

CLASS 404

6 4,880,332

CLASS 405

43 4,880,333
149 4,880,334
158 4,880,335
198 4,880,336

CLASS 407

40 4,880,337
114 4,880,338

CLASS 408

161 4,880,339
176 4,880,340

CLASS 410

1 4,880,341
121 4,880,342

CLASS 411

222 4,880,343
374 4,880,344

CLASS 414

137.9 4,880,345
486 4,880,346
542 4,880,347
783 4,880,348
786 4,880,349
790.2 4,880,350

CLASS 415

164 4,880,351
182.1 4,880,352

CLASS 416

83 4,880,353
95 4,880,354
228 4,880,355

CLASS 417

53 4,880,356
77 4,880,357
174 4,880,358
216 4,880,359
222 4,880,360
269 4,880,361
365 4,880,362
390 4,880,363
423.1 4,880,364
531 4,880,365
555.1 4,880,366

CLASS 418

107 4,880,367

CLASS 419

1 4,880,598
6 4,880,599
12 4,880,600

CLASS 422

28 4,880,601
4,880,602
218 4,880,603
220 4,880,604
232 4,880,605

CLASS 423

20 4,880,607
21.1 4,880,758
210 4,880,685
220 4,880,606
226 4,880,609
244 4,880,608
305 4,880,610
306 4,880,611
413 4,880,612
446 4,880,613

CLASS 424

1.1 4,880,615
4,880,616
43 4,880,618
52 4,880,619
70 4,880,620
74 4,880,621
78 4,880,622
4,880,623
84 4,880,624
4,880,625
88 4,880,626
195.1 4,880,630
424 4,880,631
425 4,880,632
449 4,880,633
450 4,880,634
4,880,635
470 4,880,830
480 4,880,636
501 4,880,617
605 4,880,628
640 4,880,627
641 4,880,637
662 4,880,638
678 4,880,629

CLASS 425

116 4,880,368
4,880,369
133.5 4,880,370
135 4,880,371
145 4,880,372
149 4,880,373
185 4,880,374
190 4,880,792
335 4,880,375

CLASS 426

2 4,880,639
3 4,880,640
4,880,641
5 4,880,642
16 4,880,643
46 4,880,644
89 4,880,645
93 4,880,646
239 4,880,647
241 4,880,648
302 4,880,649
330.4 4,880,650
386 4,880,656
394 4,880,651
417 4,880,652
549 4,880,653
574 4,880,654
593 4,880,655
601 4,880,657
607 4,880,658
656 4,880,659

CLASS 427

2 4,880,660
38 4,880,661
54.1 4,880,662
69 4,880,475
96 4,880,663
109 4,880,664
126.3 4,880,665
128 4,880,666
160 4,880,667
162 4,880,668
210 4,880,669
226 4,880,670
356 4,880,671
4,880,672
412 4,880,673

CLASS 428

31 4,880,674
34.2 4,880,701
35.4 4,880,697
35.7 4,880,675
4,880,676
38 4,880,677
40 4,880,678
57 4,880,679
74 4,880,680
116 4,880,681
141 4,880,687
4,880,688
143 4,880,689
152 4,880,682
200 4,880,683
209 4,880,684
212 4,880,686
224 4,880,690
225 4,880,691
323 4,880,692
4,880,693
333 4,880,698
4,880,699
336 4,880,694
337 4,880,700
341 4,880,695
349 4,880,696
354 4,880,702
378 4,880,703
395 4,880,704
447 4,880,705
516 4,880,706
565 4,880,707
620 4,880,708
623 4,880,614
B1 4,027,367
654 4,880,709

CLASS 429

13 4,880,710
40 4,880,711
97 4,880,712
100 4,880,713
197 4,880,714

CLASS 430

41 4,880,715
49 4,880,716
58 4,880,717
4,880,718
106.6 4,880,719
115 4,880,720
138 4,880,721
192 4,880,722
218 4,880,723
302 4,880,724
373 4,880,725
376 4,880,726
378 4,880,727
380 4,880,728
410 4,880,729
520 4,880,730
551 4,880,733

CLASS 431

12 4,880,376
126 4,880,377
170 4,880,378

CLASS 432

3 4,880,379

CLASS 433

11 4,880,380
28 4,880,381
118 4,880,382
189 4,880,383

CLASS 434

113 4,880,384
181 4,880,385

CLASS 435

7 4,880,731
4,880,752
29 4,880,732
68 4,880,734
71 4,880,735
87 4,880,736
106 4,880,737
4,880,738
129 4,880,739
168 4,880,740
172.3 4,880,741
238 4,880,742
240.46 4,880,744
252.4 4,880,743
253.3 4,880,745
253.5 4,880,746
254 4,880,747

CLASS 436

60 4,880,748
66 4,880,749
501 4,880,750
518 4,880,751

CLASS 437

41 4,880,753
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